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# THE NATIONAL GEOGRAPHIC MAGAZINE

APRIL, 1923

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IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resultant given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over $50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization which was waning when Pizarro first set foot in Peru.

THE Society also had the honor of subscribing a substantial sum to the historic expedition of Admiral Peary, who discovered the North Pole.

NOT long ago The Society granted $25,000, and in addition $75,000 was given by individual members through The Society to the Federal Government when the congressional appropriation for the purchase was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people and incorporated into a National Park.

THE Society is conducting extensive explorations and excavations in northwestern New Mexico, which was one of the most densely populated areas in North America before Columbus came, a region where prehistoric peoples lived in vast communal dwellings whose ruins are ranked second to none of ancient times in point of architecture, and whose customs, ceremonies and name have been engulfed in an oblivion more complete than any other people who left traces comparable to theirs.

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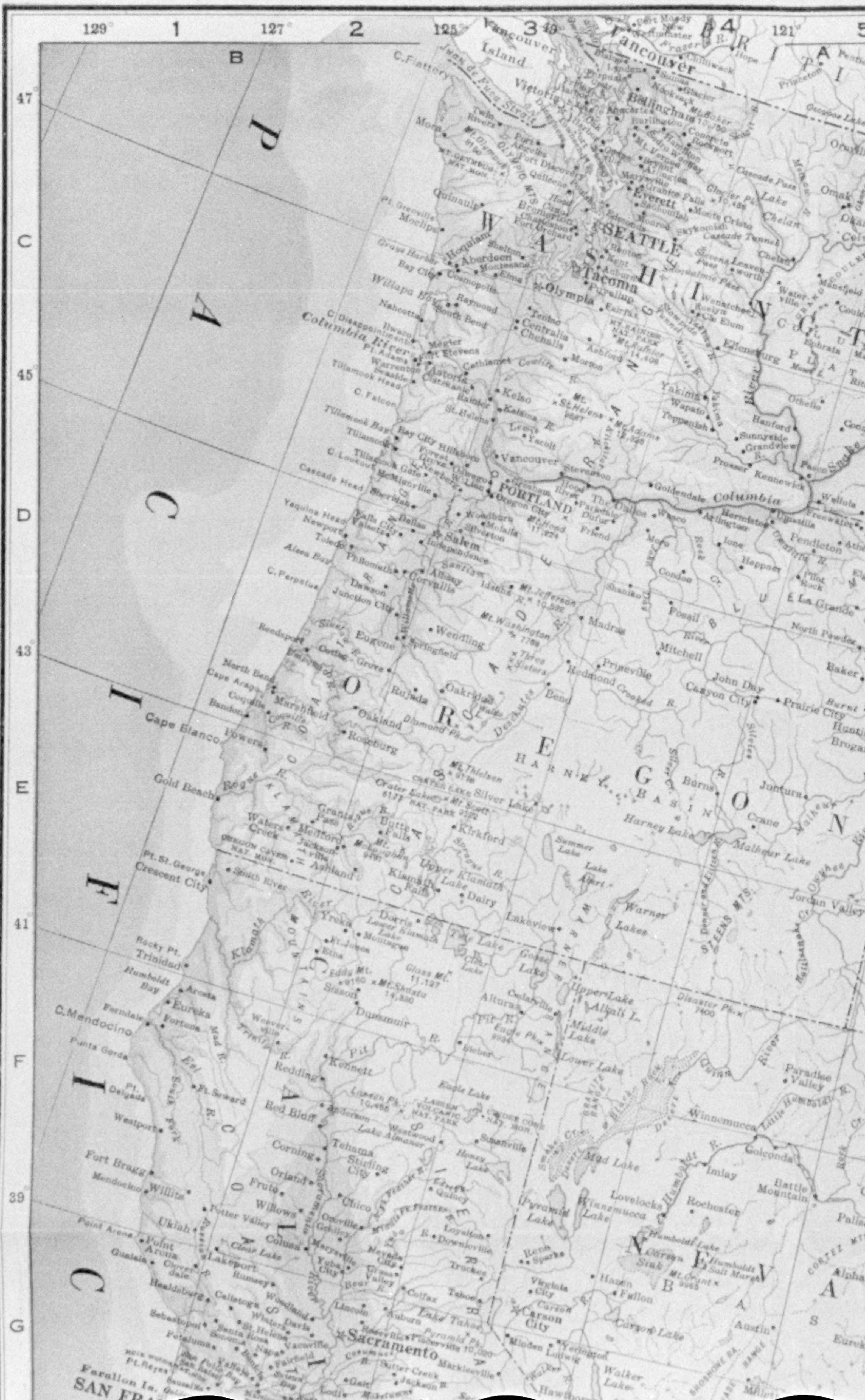

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Diamondville
Granger
Green River
Rock Springs
Superior
Rawlins
Saratoga
Encampment
Evanston
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Big Piney
Hanna
Medicine Bow
Buffalo
Jarbidge
Tuscarora
Metropolis
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Shafter
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Carlin
Palisade
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McGill
Eureka
Lucin
Wendover
Gold Hill
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Brigham
Logan
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Heber
Provo
Utah Lake
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UINTA MTS.
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CLEARWATER MOUNTAINS
SNAKE RIVER BASIN
GOOSE CREEK RANGE
SWEETWATER MTS.
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BIG BELT MTS.
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Sweetwater R.

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Mossbank
Gravelbourg Jc.
Assiniboia
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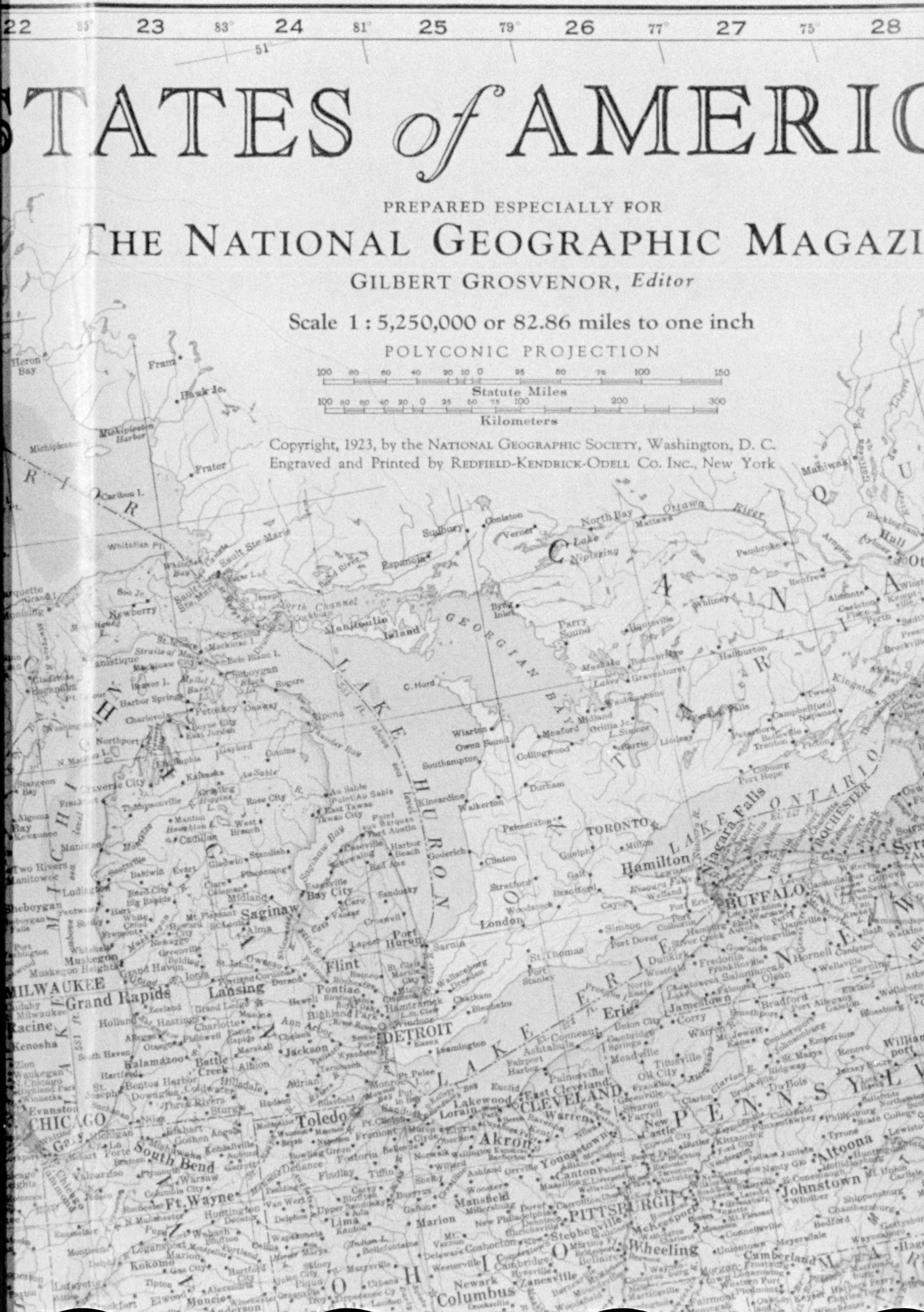

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STATES of AMERIC
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GILBERT GROSVENOR, Editor
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Statute Miles
Kilometers
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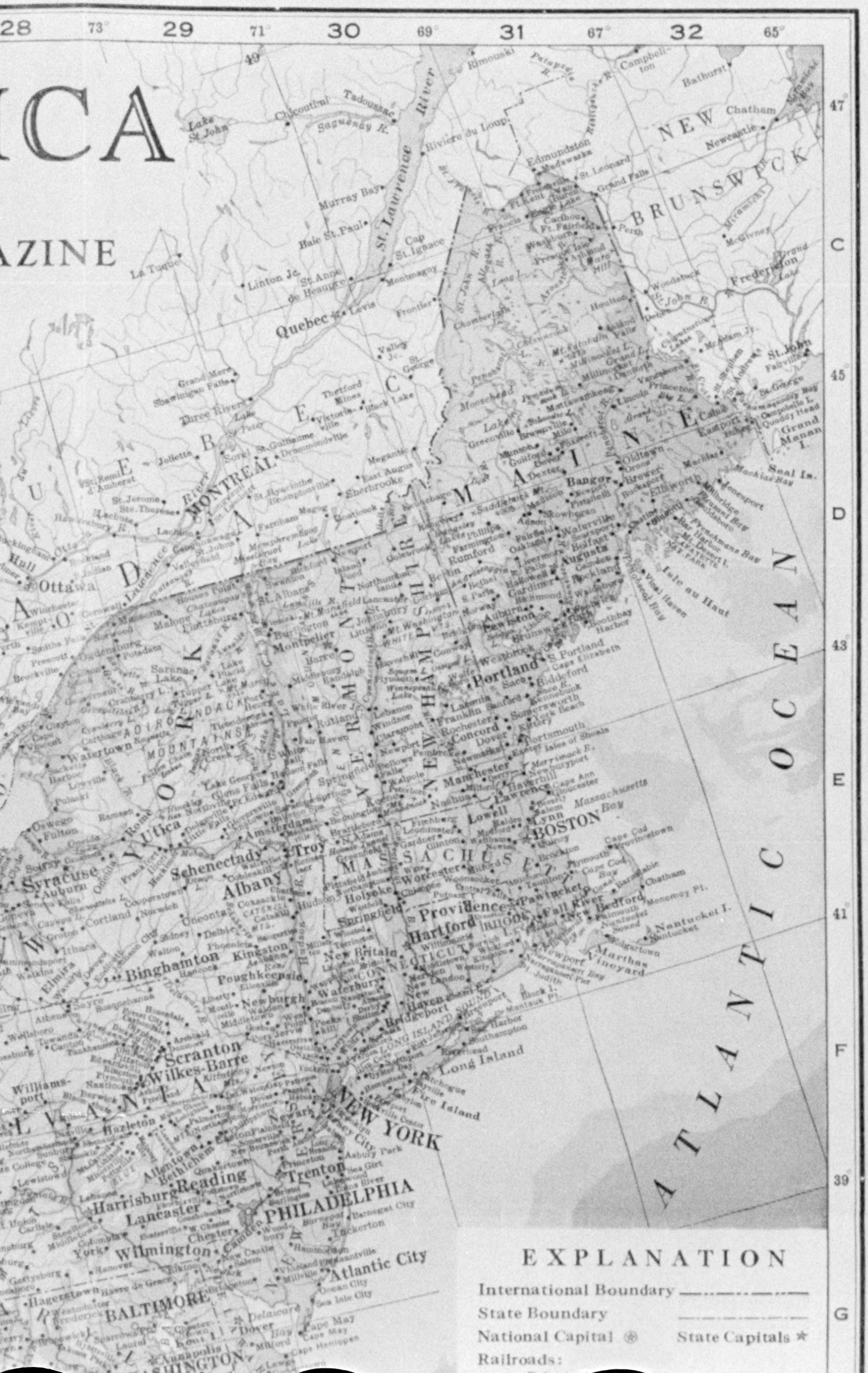
ROCHESTER



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Fredericton
St. John
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Portland
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Lowell
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Providence
Hartford
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Bridgeport
Springfield
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Reading
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NEW YORK
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San Miguel I.
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El Centro
Calexico
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Tecate
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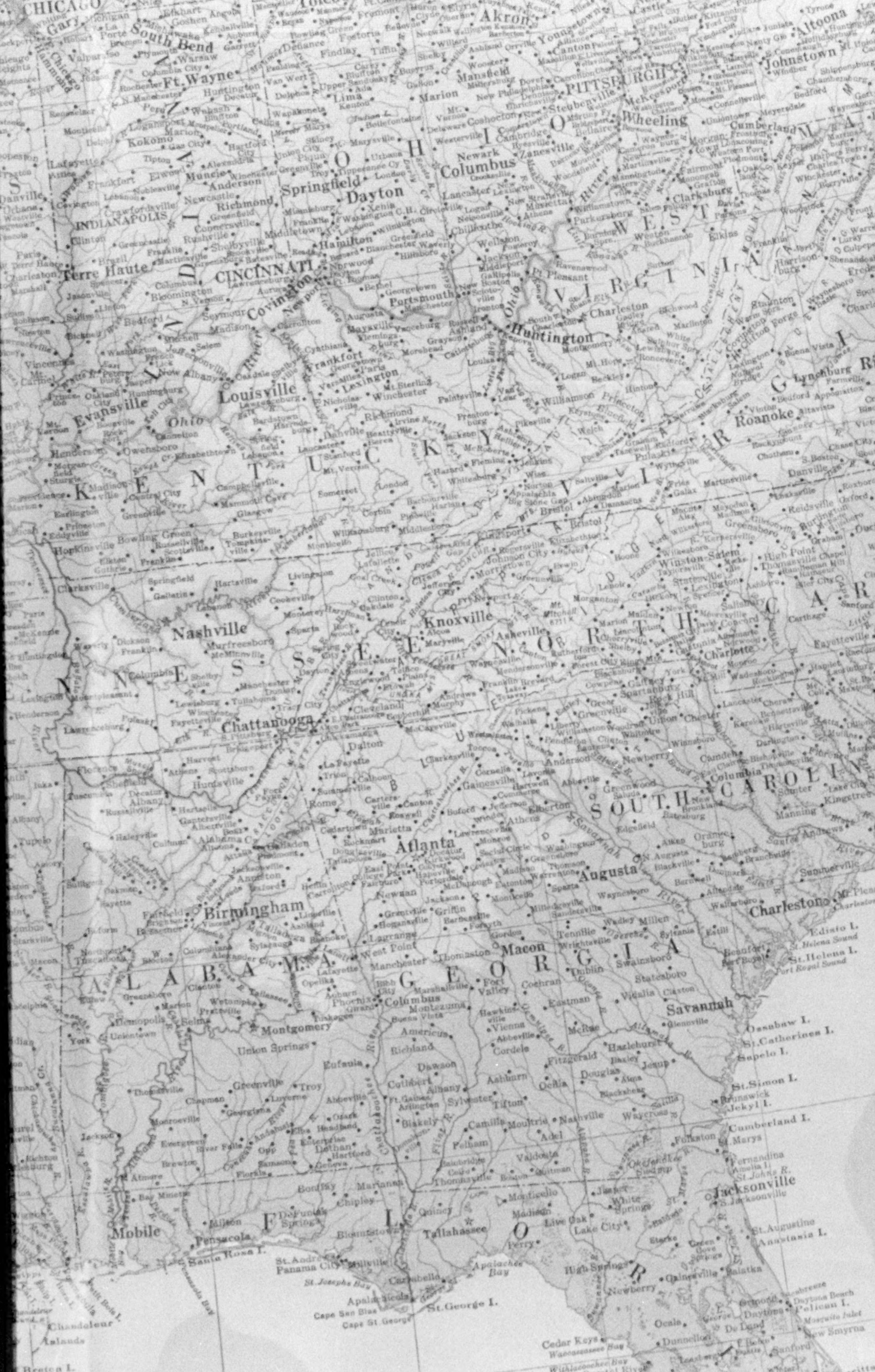
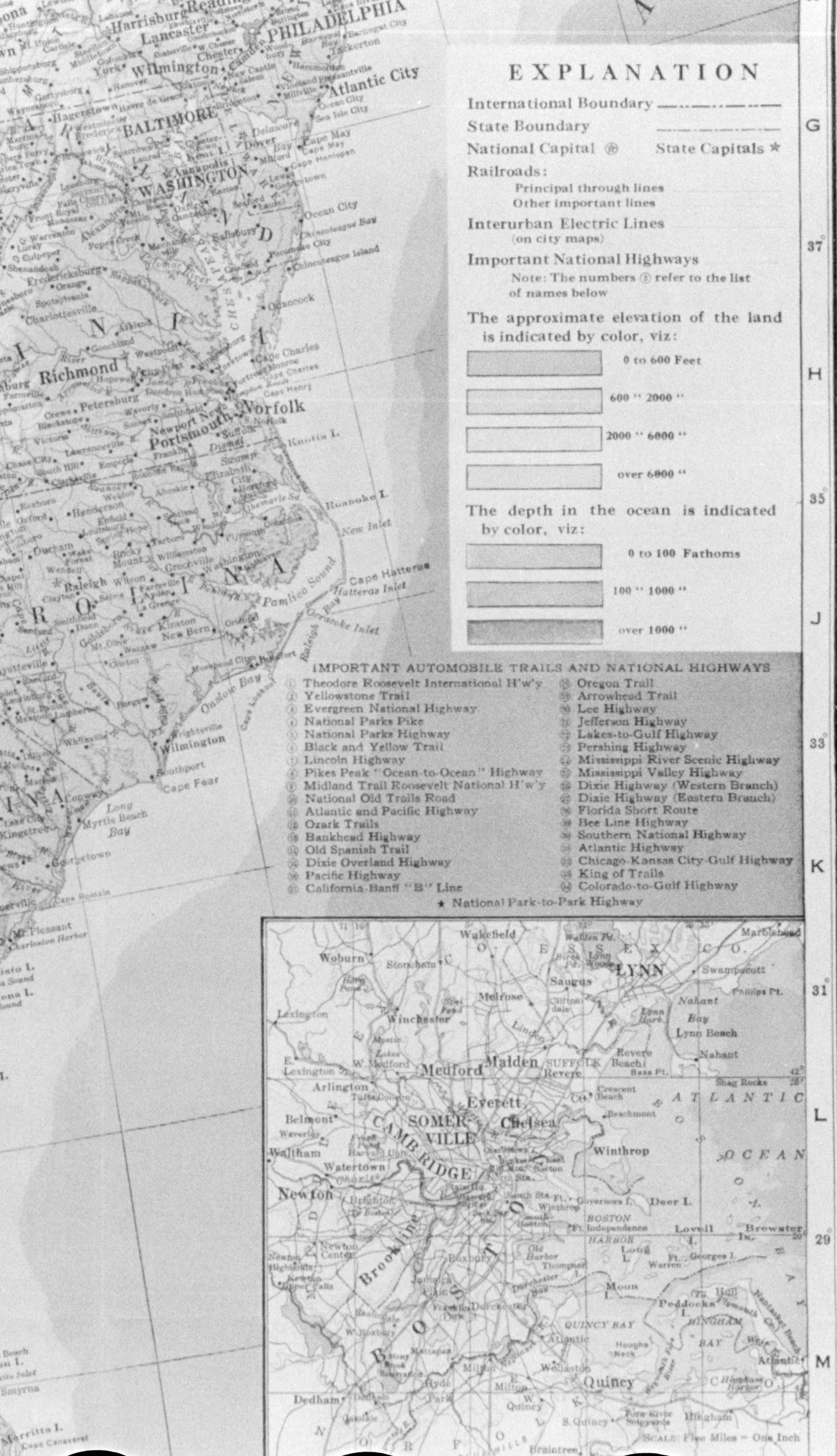
Bunkerville
Moapa
St. Thomas
Colorado
SANUP PLATEAU
GRAND CANYON NATIONAL PARK
Painted Desert
Tuba
Grand Canyon
Kayenta
Chinle
Ft. Defiance
Searchlight
Chloride
Kingman
Oatman
Needles
Williams
Ashfork
San Francisco Mts.
Flagstaff
Winslow
Holbrook
Snowflake
St. Johns
Jerome
Cottonwood
Prescott
Crown King
A R I Z O N A
Wickenburg
Phoenix
Hassayampa
Glendale
Tempe
Mesa
Gilbert
Chandler
Superior
Globe
Miami
Maricopa
Florence
Ray
San Carlos
Gila Bend
Casa Grande
Winkelman
Ajo
Silverbell
Red Rock
Tucson
Safford
Clifton
Wilcox
Bowie
Cochise
Mascot
Benson
Tombstone
Bisbee
Douglas
Nogales
Sasabe
Yuma
Blythe
Ripley
Rice
Bouse
Swansea
Parker
Gallup
Zuni
Crown Point
Thoreau
San Rafael
Laguna
N E W M E X
Magdalena
Kelly
Socorro
Carthage
San Marcial
Reserve
Mogollon
Silver City
Santa Rita
Hot Springs
Hillsboro
Tyrone
Lordsburg
Deming
Hachita
Columbus
Rincon
Las Cruces
Mesilla
Dona Ana
Alamogordo
El Paso
Juarez
Ysleta
Albuquerque
Bernalillo
Santa Fe
Estancia
Carrizozo
Farmington
Aztec
Durango
Silverton
Telluride
Ouray
Montrose
Delta
Grand Junction
Fruita
Palisade
Rifle
Glenwood Springs
Aspen
Craig
Hayden
Oak Creek
Meeker
Rangely
Creede
Alamosa
Pagosa Springs
Mancos
Dolores
C O L O
Rawlins
Rock Springs
Green River
Evanston
Encampment
Saratoga
S O N O R A
C H I H U A H U A
Hermosillo
Magdalena
Santa Ana
Altar
Pitiquito
Arizpe
Nacozari
Cananea
Agua Prieta
Moctezuma
Libertad
Tepopa
Tiburon
Puerto Isabel
La Ascencion
Casas Grandes
Carretas
GULF OF CALIFORNIA

N E B R A S K A
K A N S A S
O K L A H O M A
T E X A S
C O L O R A D O
N E W M E X I C O
Omaha
Lincoln
DENVER
Wichita
Oklahoma City
Fort Worth
Dallas
Austin
Torrington
Mitchell
Scottsbluff
Gering
Alliance
Hyannis
Bridgeport
Kimball
Sidney
Chappell
Ogallala
Lewellen
North Platte
Cheyenne
Laramie
Fort Collins
Loveland
Greeley
Sterling
Julesburg
Holyoke
Imperial
Fort Morgan
Brush
Akron
Yuma
Wray
Benkelman
McCook
Cambridge
Curtis
Gothenburg
Lexington
Kearney
Grand Island
Hastings
Red Cloud
Superior
Aurora
York
Broken Bow
Burwell
Loup City
Ravenna
Norfolk
Fremont
Brighton
Boulder
Georgetown
Leadville
Castle Rock
Deertrail
Limon
Hugo
Flagler
Burlington
Goodland
Colby
St. Francis
Oberlin
Norton
Phillipsburg
Smith Center
Mankato
Belleville
Concordia
Beloit
Osborne
Oakley
Wakeeney
Hays
Ellis
Russell
Ellsworth
Lincoln
Minneapolis
Abilene
Salina
Junction City
Manhattan
Colorado Springs
Fountain
Cañon City
Salida
Pueblo
Ordway
Eads
Cheyenne Wells
Sharon Springs
Scott City
Lamar
Las Animas
La Junta
Rocky Ford
Fowler
Walsenburg
La Veta
Trinidad
Aguilar
Springfield
Garden City
Lakin
Dodge City
Jetmore
Great Bend
Larned
Kinsley
Hoisington
Lyons
Sterling
Hutchinson
Newton
Emporia
Pratt
Kingman
Wellington
Harper
Anthony
Medicine Lodge
Kiowa
Coldwater
Ashland
Bucklin
Englewood
Liberal
Elkhart
Arkansas City
Winfield
El Dorado
Raton
Folsom
Des Moines
Maxwell
Springer
Clayton
Wagon Mound
Roy
Santa Fe
Las Vegas
E. Las Vegas
Tucumcari
Santa Rosa
Puerto de Luna
Vaughn
Torrance
Fort Sumner
Melrose
Clovis
Texico
Farwell
Portales
Elida
Roswell
Dexter
Hagerman
Artesia
Carlsbad
Lovington
Hope
Capitan
Carrizozo
Lincoln
Boise City
Guymon
Beaver
Buffalo
Alva
Woodward
Shattuck
Taloga
Enid
Blackwell
Ponca City
Pawhuska
Bartlesville
Perry
Guthrie
Stillwater
Cushing
Kingfisher
El Reno
Weatherford
Clinton
Elk City
Sayre
Cordell
Hobart
Mangum
Altus
Anadarko
Chickasha
Norman
Shawnee
Lawton
Duncan
Ada
Ardmore
Dalhart
Spearman
Lipscomb
Canadian
Panhandle
Amarillo
Shamrock
Canyon
Hereford
Clarendon
Memphis
Wellington
Tulia
Childress
Plainview
Lockney
Floydada
Paducah
Vernon
Quanah
Wichita Falls
Henrietta
Gainesville
Sherman
Denison
Lubbock
Crosbyton
Slaton
Spur
Tahoka
Post
Seymour
Haskell
Graham
Seagraves
Seminole
Lamesa
Snyder
Fluvanna
Sweetwater
Abilene
Colorado
Big Spring
Midland
Sterling City
San Angelo
Ballinger
Brownwood
Eastland
Cisco
Ranger
Stephenville
Cleburne
Waco
Temple
Belton
Hillsboro
Sherwood
Eden
Brady
Menard
Ozona
Sonora
Llano
Fredericksburg
Kerrville
Georgetown
Taylor
San Marcos
Lockhart
New Braunfels
Sanderson
Comstock
Pecos
Barstow
Toyahvale
Fort Stockton
Ft. Davis
Alpine
Marfa
Candelaria
Ruidosa
Presidio
Ojinaga
Sierra Blanca
Seligman
LLANO ESTACADO
STAKED PLAIN
EDWARDS PLATEAU
Arkansas River
Canadian River
Cimarron R.
Red R.
Brazos
Colorado R.
Pecos
Rio Grande
Platte
Republican
Smoky Hill River

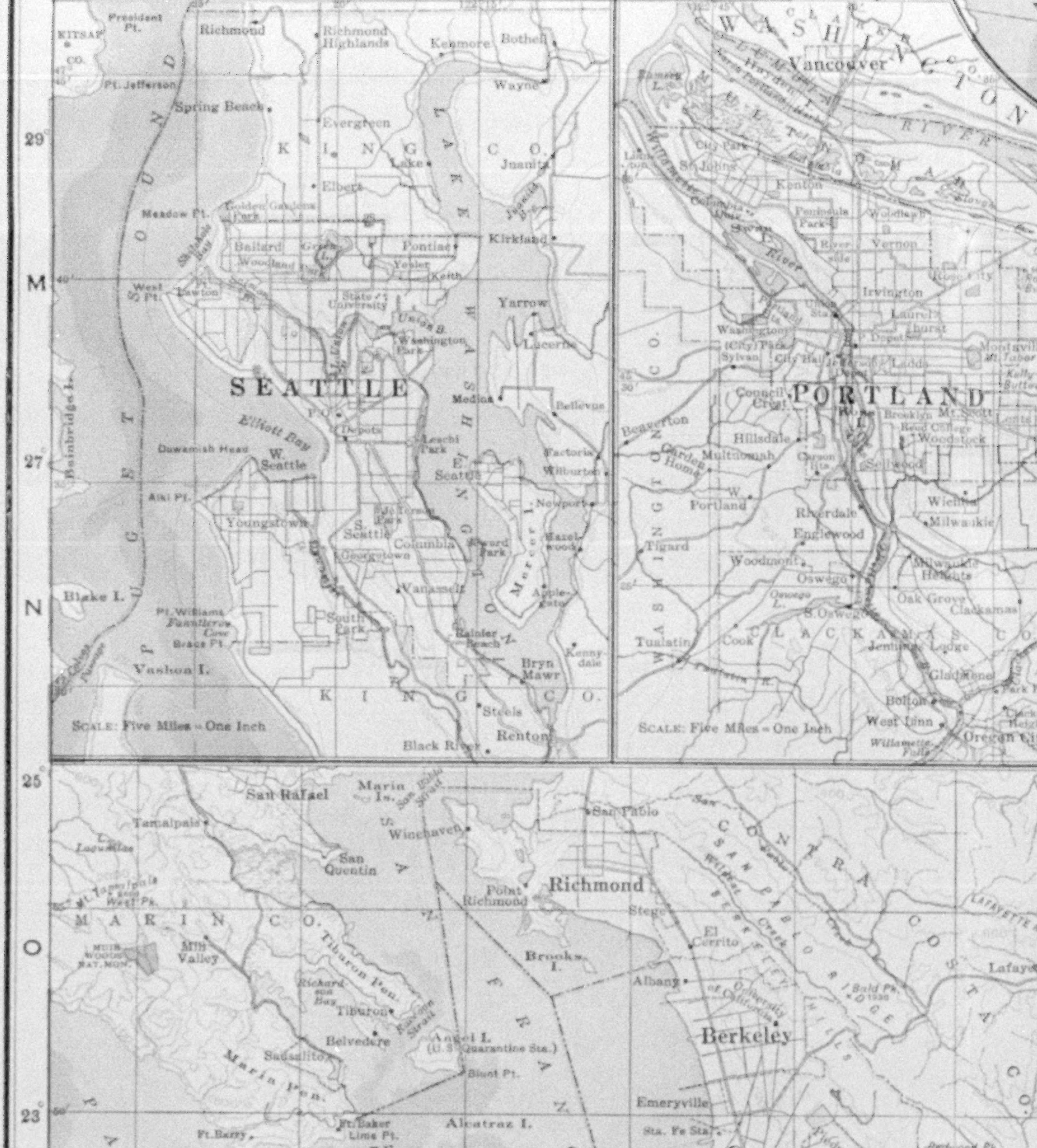
I O W A
ILLINOIS
MISSOURI
ARKANSAS
LOUISIANA
MISSISSIPPI
TENNESSEE
CHICAGO
Des Moines
Omaha
Council Bluffs
Lincoln
Davenport
Cedar Rapids
Rock Island
Moline
Peoria
Springfield
Bloomington
Decatur
Quincy
St.Joseph
Kansas City
KANSAS CITY
Topeka
ST.LOUIS
E.St.Louis
Jefferson City
Springfield
Joplin
Evansville
Terre Haute
INDIANAPOLIS
Cape Girardeau
Cairo
Paducah
Memphis
Little Rock
Hot Springs
Fort Smith
Muskogee
Tulsa
Pine Bluff
Texarkana
Shreveport
Vicksburg
Jackson
Natchez
Baton Rouge
NEW ORLEANS
Mobile
Houston
Beaumont
Port Arthur
Galveston
Alexandria
Monroe
Greenville
Meridian
Hattiesburg
Tupelo
Columbus
Mississippi
Missouri River
OZARK
OUACHITA MTS.
BOSTON MTS.
Lake Pontchartrain
Chandeleur Islands
Breton I.



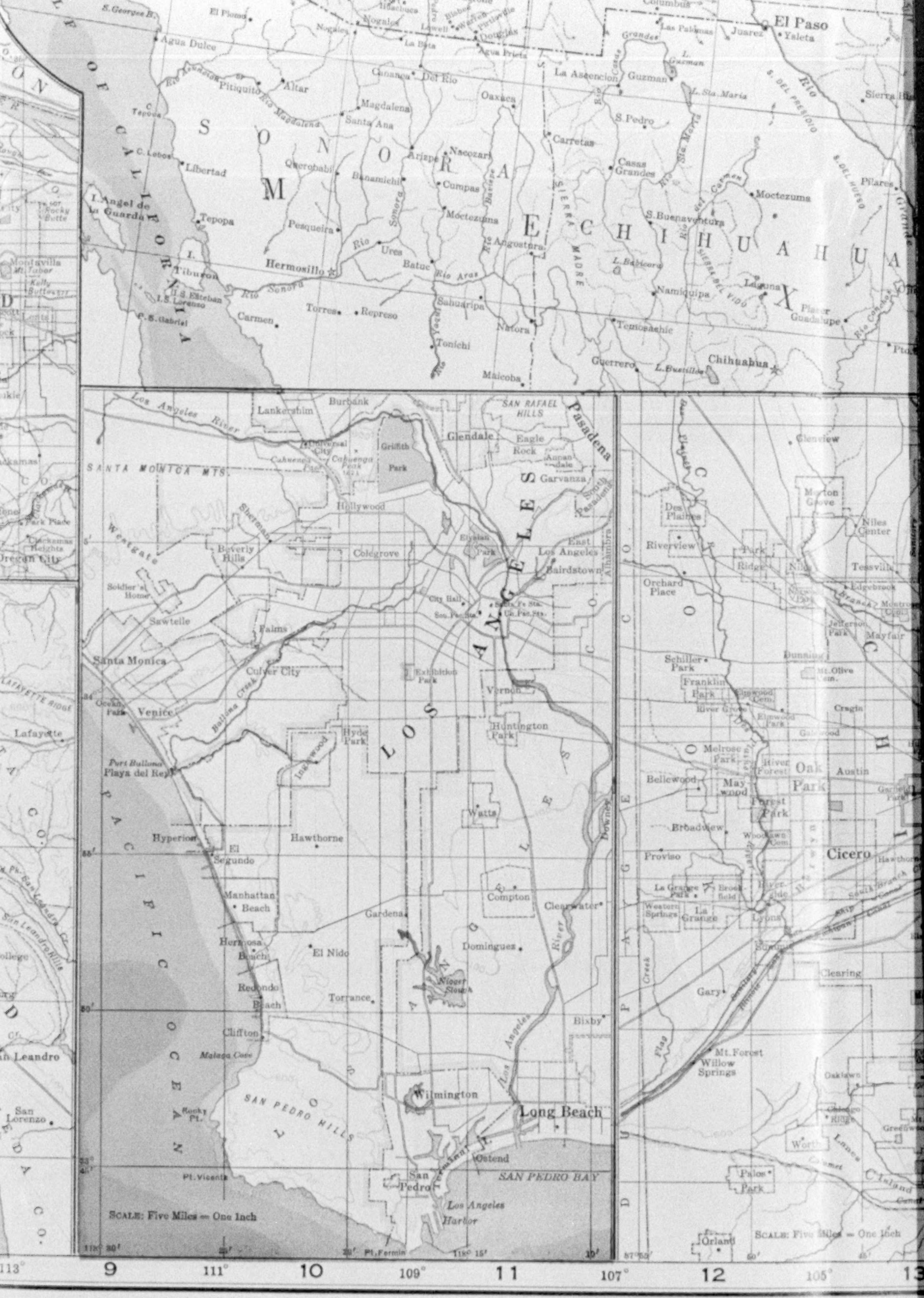
CHICAGO
Gary
South Bend
Ft. Wayne
Toledo
Akron
Youngstown
PITTSBURGH
Altoona
Johnstown
Kokomo
Lafayette
Muncie
Anderson
Richmond
Springfield
Dayton
Columbus
Wheeling
Cumberland
Danville
INDIANAPOLIS
Terre Haute
CINCINNATI
Hamilton
Covington
Newport
Portsmouth
Huntington
Charleston
Clarksburg
Evansville
Louisville
Frankfort
Lexington
Owensboro
Henderson
Roanoke
Lynchburg
Nashville
Knoxville
Asheville
Chattanooga
Winston-Salem
Charlotte
Birmingham
Atlanta
Augusta
Columbia
Charleston
Macon
Columbus
Montgomery
Savannah
Jacksonville
Mobile
Pensacola
Tallahassee
OHIO
WEST VIRGINIA
KENTUCKY
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
ALABAMA
FLORIDA



EXPLANATION
International Boundary
State Boundary
National Capital
State Capitals ★
Railroads:
Principal through lines
Other important lines
Interurban Electric Lines
(on city maps)
Important National Highways
Note: The numbers ② refer to the list of names below
The approximate elevation of the land is indicated by color, viz:
0 to 600 Feet
600 " 2000 "
2000 " 6000 "
over 6000 "
The depth in the ocean is indicated by color, viz:
0 to 100 Fathoms
100 " 1000 "
over 1000 "
IMPORTANT AUTOMOBILE TRAILS AND NATIONAL HIGHWAYS
(1) Theodore Roosevelt International H'w'y
(2) Yellowstone Trail
(3) Evergreen National Highway
(4) National Parks Pike
(5) National Parks Highway
(6) Black and Yellow Trail
(7) Lincoln Highway
(8) Pikes Peak "Ocean-to-Ocean" Highway
(9) Midland Trail Roosevelt National H'w'y
(10) National Old Trails Road
(11) Atlantic and Pacific Highway
(12) Ozark Trails
(13) Bankhead Highway
(14) Old Spanish Trail
(15) Dixie Overland Highway
(16) Pacific Highway
(17) California-Banff "B" Line
(18) Oregon Trail
(19) Arrowhead Trail
(20) Lee Highway
(21) Jefferson Highway
(22) Lakes-to-Gulf Highway
(23) Pershing Highway
(24) Mississippi River Scenic Highway
(25) Mississippi Valley Highway
(26) Dixie Highway (Western Branch)
(27) Dixie Highway (Eastern Branch)
(28) Florida Short Route
(29) Bee Line Highway
(30) Southern National Highway
(31) Atlantic Highway
(32) Chicago-Kansas City-Gulf Highway
(33) King of Trails
(34) Colorado-to-Gulf Highway
★ National Park-to-Park Highway
PHILADELPHIA
BALTIMORE
WASHINGTON
Atlantic City
Richmond
Norfolk
Portsmouth
Raleigh
Wilmington
Cape Hatteras
Pamlico Sound
Onslow Bay
Cape Fear
LYNN
Medford
Malden
Everett
Chelsea
SOMERVILLE
CAMBRIDGE
Newton
Brookline
Winthrop
Quincy
ATLANTIC OCEAN
SCALE: Five Miles = One Inch
G
H
J
K
L
M
37°
35°
33°
31°
29°



SEATTLE
KING CO.
PUGET SOUND
LAKE WASHINGTON
Richmond
Richmond Highlands
Kenmore
Bothell
Wayne
Spring Beach
Evergreen
Lake
Juanita
Elbert
Meadow Pt.
Ballard
Pontiac
Kirkland
West Pt.
Lawton
State University
Yarrow
Lucerne
Medina
Bellevue
Elliott Bay
Duwamish Head
W. Seattle
Alki Pt.
Youngstown
Factoria
Wilburton
Newport
S. Seattle
Columbia
Georgetown
Vanasselt
Seward Park
Mercer I.
Blake I.
Pt. Williams
Vashon I.
South Park
Rainier Beach
Bryn Mawr
Kennydale
Steele
Renton
Black River
Bainbridge I.
SCALE: Five Miles = One Inch
PORTLAND
WASHINGTON
Vancouver
St. Johns
Kenton
Peninsula Park
Woodlawn
Vernon
Irvington
Laurelhurst
Washington (City) Park
Sylvan
Council Crest
Beaverton
Garden Home
Multnomah
Hillsdale
W. Portland
Riverdale
Englewood
Tigard
Woodmont
Oswego
S. Oswego
Milwaukie
Milwaukie Heights
Oak Grove
Clackamas
Tualatin
Cook
CLACKAMAS CO.
Bolton
West Linn
Gladstone
Oregon City
Willamette Falls
Sellwood
Woodstock
Mt. Scott
SCALE: Five Miles = One Inch
San Rafael
Marin Is.
Tamalpais
Winehaven
San Pablo
San Quentin
Point Richmond
Richmond
Stege
El Cerrito
MARIN CO.
Mill Valley
Tiburon Pen.
Brooks I.
Albany
Tiburon
Belvedere
Angel I.
Berkeley
CONTRA COSTA CO.
Sausalito
Marin Pen.
Blunt Pt.
Emeryville
Ft. Baker
Alcatraz I.
Ft. Barry
Punta Bonita
GOLDEN GATE
Ft. Mason
Goat I.
OAKLAND
Piedmont
Telegraph Hill
Lincoln Park
Seal Rocks
Cliff House
Richmond
Golden Gate Park
Sunset
Mission
Potrero
Alameda
E. Oakland
Fruitvale
Mills College
Melrose
Fitchburg
Elmhurst
SAN FRANCISCO
South San Francisco
Avisadero Pt.
San Leandro
PACIFIC OCEAN
SAN FRANCISCO BAY
Visitation Valley
Daly City
Visitacion
San Lorenzo
ALAMEDA CO.
SAN MATEO CO.
South San Francisco
San Bruno Pt.
San Bruno
Statute Miles
Five Miles = One Inch
5
6
7
8
119°
117°
115°
113°
M
N
O
P
Q

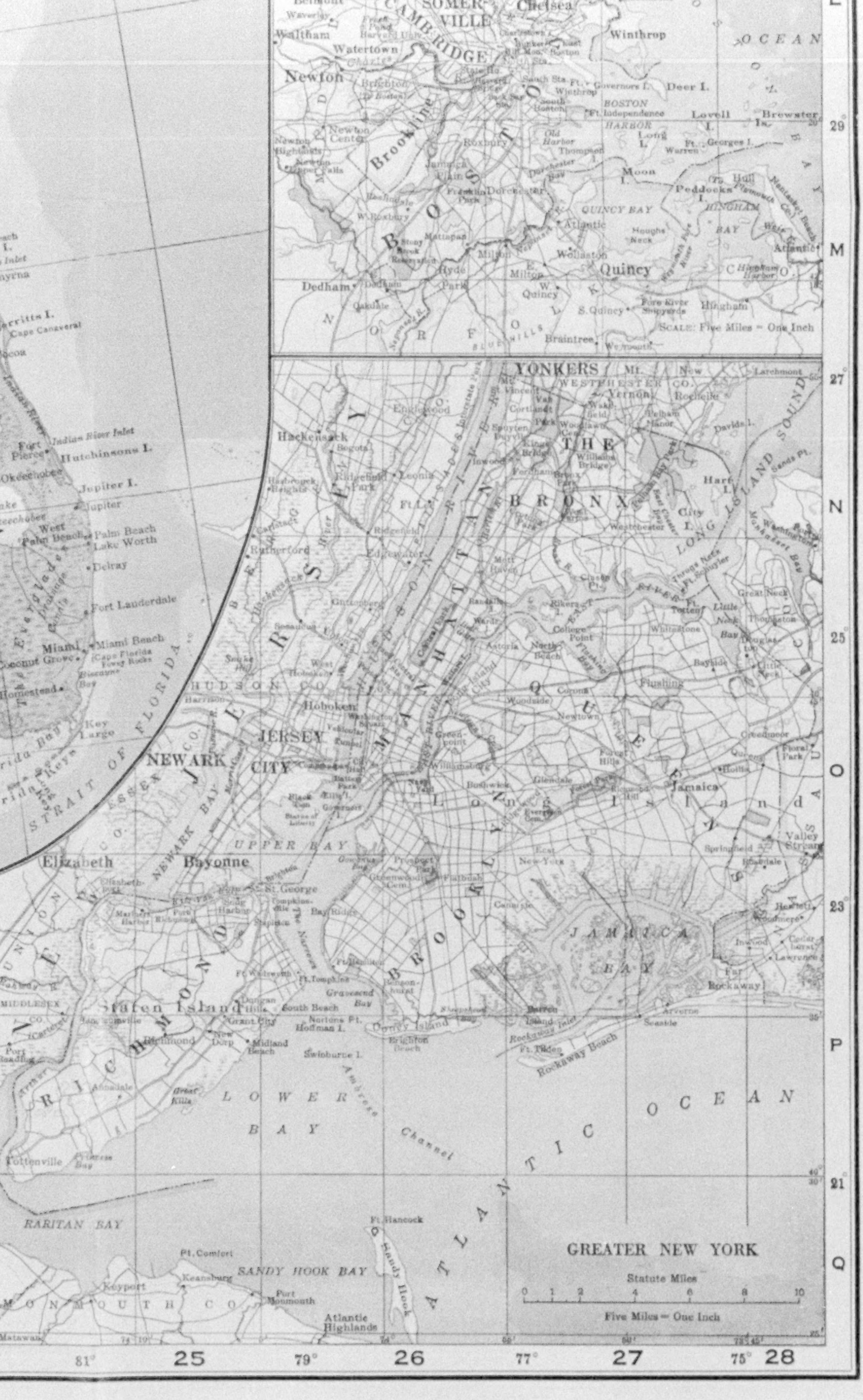


El Paso
Ysleta
Juarez
Las Palomas
Columbus
Agua Dulce
Nogales
Douglas
Agua Prieta
La Ascencion
Guzman
Cananea
Del Rio
Pitiquito
Altar
Magdalena
Santa Ana
Oaxaca
S. Pedro
Carretas
Casas Grandes
Libertad
Arizpe
Nacozari
Cumpas
Moctezuma
Banamichi
S O N O R A
M E X
C H I H U A H U A
Pesqueira
Tepopa
Hermosillo
Ures
Batuc
Rio Aros
Angostura
S.Buenaventura
Moctezuma
Pilares
Sierra Blanca
L. Babicora
Namiquipa
Laguna
Placer Guadalupe
Tiburon
Torres
Represo
Carmen
Sahuaripa
Natora
Tonichi
Matcoba
Temosachic
Guerrero
Chihuahua
L. Bustillos
SIERRA MADRE
Los Angeles River
Lankershim
Burbank
SAN RAFAEL HILLS
Pasadena
Glendale
Eagle Rock
Griffith Park
SANTA MONICA MTS.
Garvanza
South Pasadena
Hollywood
Sherman
Westgate
Beverly Hills
Colegrove
Elysian Park
East Los Angeles
Bairdstown
Alhambra
Soldier's Home
City Hall
Sawtelle
Palms
Santa Monica
Culver City
Exhibition Park
Vernon
Ocean Park
Venice
Ballona Creek
Huntington Park
Hyde Park
Inglewood
LOS ANGELES
Port Ballona
Playa del Rey
Watts
Downey
Hyperion
El Segundo
Hawthorne
Manhattan Beach
Compton
Clearwater
Gardena
Hermosa Beach
El Nido
Dominguez
Redondo Beach
Torrance
Bixby
Clifton
Malaga Cove
SAN PEDRO HILLS
Wilmington
Long Beach
Ostend
SAN PEDRO BAY
San Pedro
Pt. Vicente
Los Angeles Harbor
Pt. Fermin
PACIFIC OCEAN
SCALE: Five Miles = One Inch
Glenview
Morton Grove
Des Plaines
Niles Center
Riverview
Park Ridge
Niles
Tessville
Orchard Place
Edgebrook
Jefferson Park
Mayfair
Dunning
Schiller Park
Franklin Park
Elmwood Park
Cragin
River Grove
Galewood
Melrose Park
River Forest
Oak Park
Austin
Bellwood
Maywood
Forest Park
Broadview
Cicero
Proviso
La Grange Park
Brookfield
Western Springs
La Grange
Lyons
Summit
Clearing
Gary
Mt. Forest
Willow Springs
Oaklawn
Chicago Ridge
Worth
Palos Park
Orland
SCALE: Five Miles = One Inch
Montavilla
Oregon City
Lafayette
San Leandro
San Lorenzo
113°
9
111°
10
109°
11
107°
12
105°
13

T E X A S
Midland
Barstow
Pecos
Sierra Blanca
Toyahvale
Fort Stockton
Ft. Davis
Alpine
Marfa
Pilares
Candelaria
Ruidosa
Presidio
Ojinaga
Lajitas
McKinney Sprs.
San Carlos
Pto. Monier
S. Vicente
El Pino
Sanderson
Sonora
Ozona
E D W A R D S
P L A T E A U
Menard
Brady
Eden
San Angelo
Sherwood
Sterling City
Winters
Coleman
Ballinger
Miles
Brownwood
Llano
Georgetown
Fredericksburg
Austin
Kerrville
Boerne
San Marcos
New Braunfels
San Antonio
Seguin
Lockhart
Luling
Gonzales
Smithville
Bastrop
Brenham
Giddings
Waco
Temple
Belton
Taylor
Elgin
Comstock
Del Rio
Brackettville
Uvalde
Spofford
Eagle Pass
Piedras Negras
Crystal City
Carrizo Springs
Asherton
Pearsall
Cotulla
Pleasanton
Kenedy
Cuero
Victoria
Beeville
Sinton
Rockport
Corpus Christi
Alice
San Diego
Kingsville
Falfurrias
Encinal
Hidalgo
Colombia
Sto. Tomas
Nuevo Laredo
Laredo
Jarita
San Ygnacio
Zapata
Riogrande
Mission
Edinburg
McAllen
Mercedes
San Benito
Brownsville
Point Isabel
Padre Island
Mustang Isl.
Mier
Camargo
Reinosa
Matamoros
Charco Escondido
Santa Rosa
TAMAULIPAS
C O A H U I L A
SERRANIAS DEL BURRO
Zaragoza
Allende
Guerrero
Murguiz
Sabinas
S. Felipe
Barroteran
Rodriguez
Lampazos
Minas Viejas
Vallecillo
Bustamante
Villaldama
Sabinas Hidalgo
Agualeguas
N U E V O
L E O N
Los Herreras
Los Ramonos
China
Monterrey
Saltillo
Montemorelos
Mendez
Galeana
Linares
S. Carlos
Boquillas Cerrades
B. de S. Antonio
Rio Grande
L A K E
M I C H I G A N
C H I C A G O
Kenilworth
Wilmette
Evanston
Niles Center
Calvary Cem.
West Ridge
Rogers Park
Rose Hill Cem.
Mayfair
Lake View
Graceland Cem.
Lincoln Park
Humboldt Park
Austin
Garfield Park
Douglas Park
Cicero
Hawthorne
Union Stock Yards
Washington Park
Jackson Park
Englewood
Marquette Park
Hyde Park
South Chicago
Calumet Harbor
Calumet Park
Pullman
Calumet Lake
Wolf Lake
Blue Island
Riverdale
Harvey
Hammond
Dolton
L A K E
P O N T C H A R T R A I N
N E W
O R L E A N S
West End
Milneburg
City Park
South Port
Algiers
Gretna
Harvey
Westwego
Amesville
Tulane University
ORLEANS PARISH
ST. BERNARD PAR.
Arabi
PLAQUEMINES PARISH
English Turn
Lake Catouche
J E F F E R S O N
P A R I S H
M I S S I S S I P P I
R I V E R
SCALE: Five Miles = One Inch
One Inch
13
103°
14
101°
15
99° Longitude 16 West
97°
from

Houston
Galveston
Beaumont
Port Arthur
Orange
Bay City
Freeport
Matagorda
Matagorda Island
Baton Rouge
NEW ORLEANS
Mobile
Chandeleur Islands
Breton I.
Marsh I.
Delta of the Mississippi
G U L F
O F
M E
BALTIMORE
SCALE: Five Miles = One Inch
DETROIT
Highland Park
Hamtramck
Windsor
ONTARIO
DOM. OF CANADA
Sandwich
SCALE: Five Miles = One Inch
PITTSBURGH
SCALE: Five Miles = One Inch
LAKE ERIE
CLEVELAND
Lakewood
East Cleveland
Cleveland Heights
SCALE: Five Miles = One Inch
WASHINGTON
Alexandria
ARLINGTON CO.
FAIRFAX CO.
SCALE: Five Miles = One Inch
ST. LOUIS
East St. Louis
Webster Groves
SCALE: Five Miles = One Inch
PHILADELPHIA
from 17 Greenwich 95° 18 93° 19 91° 20 89° 21

F L O R I D A
GULF OF MEXICO
Mobile
Pensacola
Santa Rosa I.
Tallahassee
Jacksonville
St. Augustine
Anastasia I.
Gainesville
Palatka
Ocala
Daytona
New Smyrna
Sanford
Orlando
Kissimmee
Tampa
West Tampa
Plant City
Lakeland
St. Petersburg
Clearwater
Tarpon Springs
Bradentown
Sarasota
Palmetto
Manatee
Arcadia
Nokomis
Punta Gorda
Fort Myers
Punta Rasa
Sanibel I.
Immokalee
Cape Romano
Ten Thousand Islands
Cape Sable
Dry Tortugas
Marquesas Keys
Key West
Florida Bay
Cedar Keys
Crystal River
Inverness
Brooksville
Dade City
Apalachicola
Carrabelle
St. George I.
Cape St. George
Cape San Blas
St. Andrews
Panama City
Chandeleur Islands
Breton I.
Cumberland I.
St. Simon I.
Brunswick
Jekyl I.
Fernandina
Amelia I.
Lake Okeechobee
PITTSBURGH
Allegheny Co.
Etna
Sharpsburg
Wilkinsburg
Swissvale
Braddock
Carrick
Homestead
Duquesne
McKeesport
Glassport
Dravosburg
Scale: Five Miles = One Inch
PHILADELPHIA
Germantown
Frankford
Tacony
Camden
Gloucester
Collingswood
Merchantville
NEW JERSEY
DELAWARE RIVER
Scale: Five Miles = One Inch
NIAGARA
Lewiston
Niagara University
Whirlpool
Suspension Bridge
Niagara Falls
La Salle
Walmore
Bergholtz
Chippawa
Navy I.
Grand Island
Tonawanda
North Tonawanda
Eagle Park
Black Creek
Snyder
Shipyard
Stevensville
Ridgemount
Bridgeburg
Fort Erie
Stony Quarry
Ridgeway
Crystal Beach
Windmill Pt.
LAKE ERIE
BUFFALO
Kenmore
Williamsville
Depew
Sloan
Lackawanna
Woodlawn Beach
Stony Pt.
ONTARIO
CANADA
Scale: Five Miles = One Inch
89°
21
87°
22
85°
23
83°
24



GREATER NEW YORK
Statute Miles
0 1 2 4 6 8 10
Five Miles = One Inch
SCALE: Five Miles = One Inch
CAMBRIDGE
SOMERVILLE
Chelsea
Waltham
Watertown
Winthrop
Newton
Brookline
BOSTON
BOSTON HARBOR
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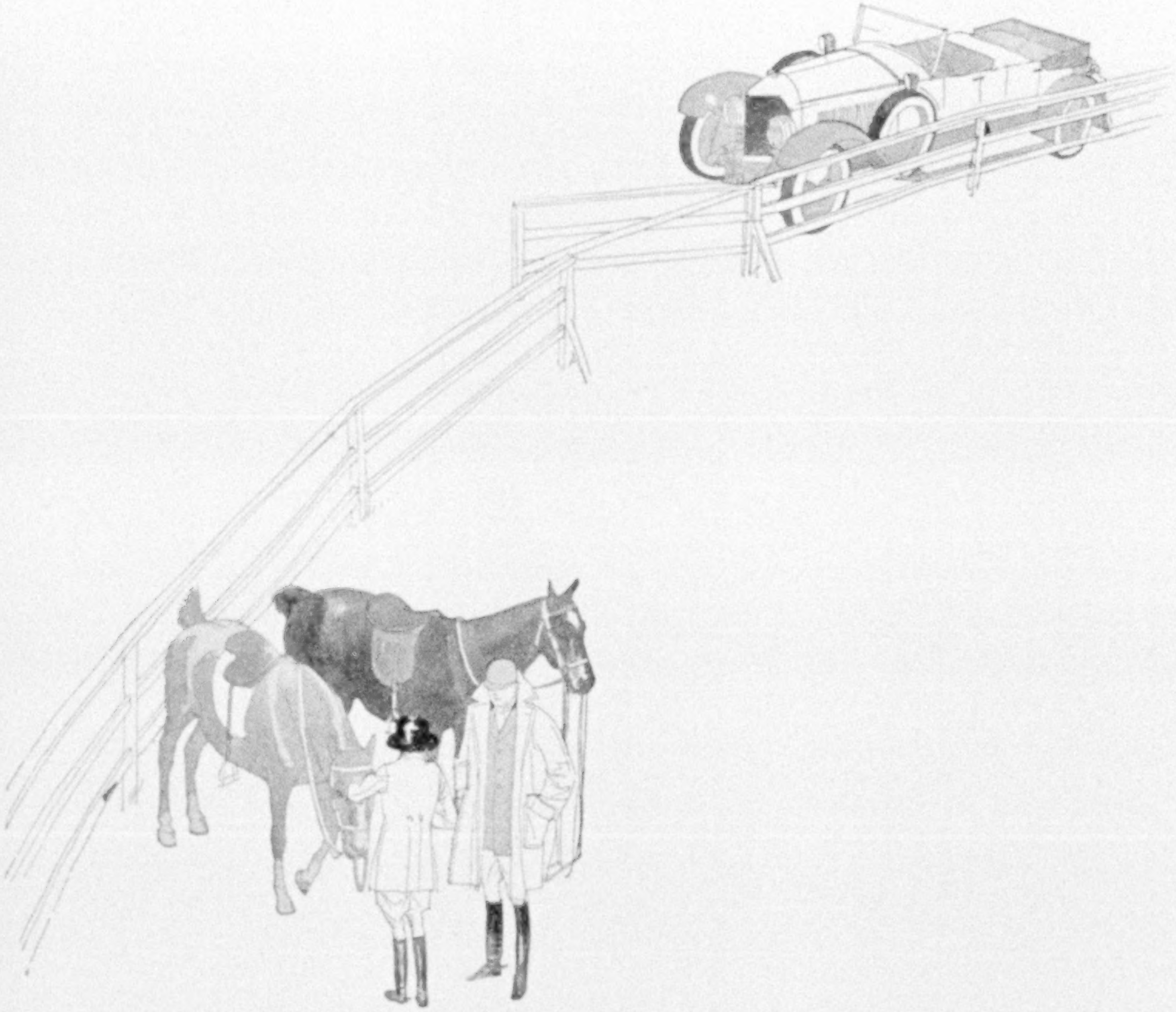


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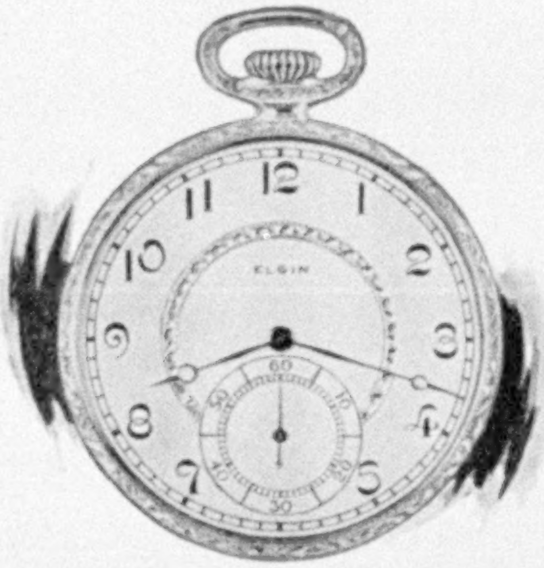


The "Streamline" Elgin cased in Yellow, White or Green Gold or Gold-filled—plain or engraved.
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# *Is it typically American to Apologize for your Watch?*

IT is curious that the more widely used watches became the more careless people grew about *correct* time.

Many a man of your acquaintance can't tell you the time without a pause for some mental arithmetic.

Everywhere you go you meet people who apologize for their time-keepers.

Poor time seems to be a bad national habit.

• • •

The few reasons are these: Cheap watches. Careless treatment. Watches bought haphazard as jewelry rather than time-pieces. Putting off the day of buying a *good* watch.

There are symptoms today, nevertheless, that people are changing in their attitude toward watches.

This has clearly shown itself to the Elgin watchmakers, who for the past two years have been unable to supply all the Elgin Watches people asked for.

This is all the more significant when you consider that Elgin standards are such that it has only a selected, limited audience and does not try to sell watches broadcast.

The desire to own an Elgin Watch shows itself as an expression towards *better* watches.

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It takes a year or more to make an Elgin Watch.

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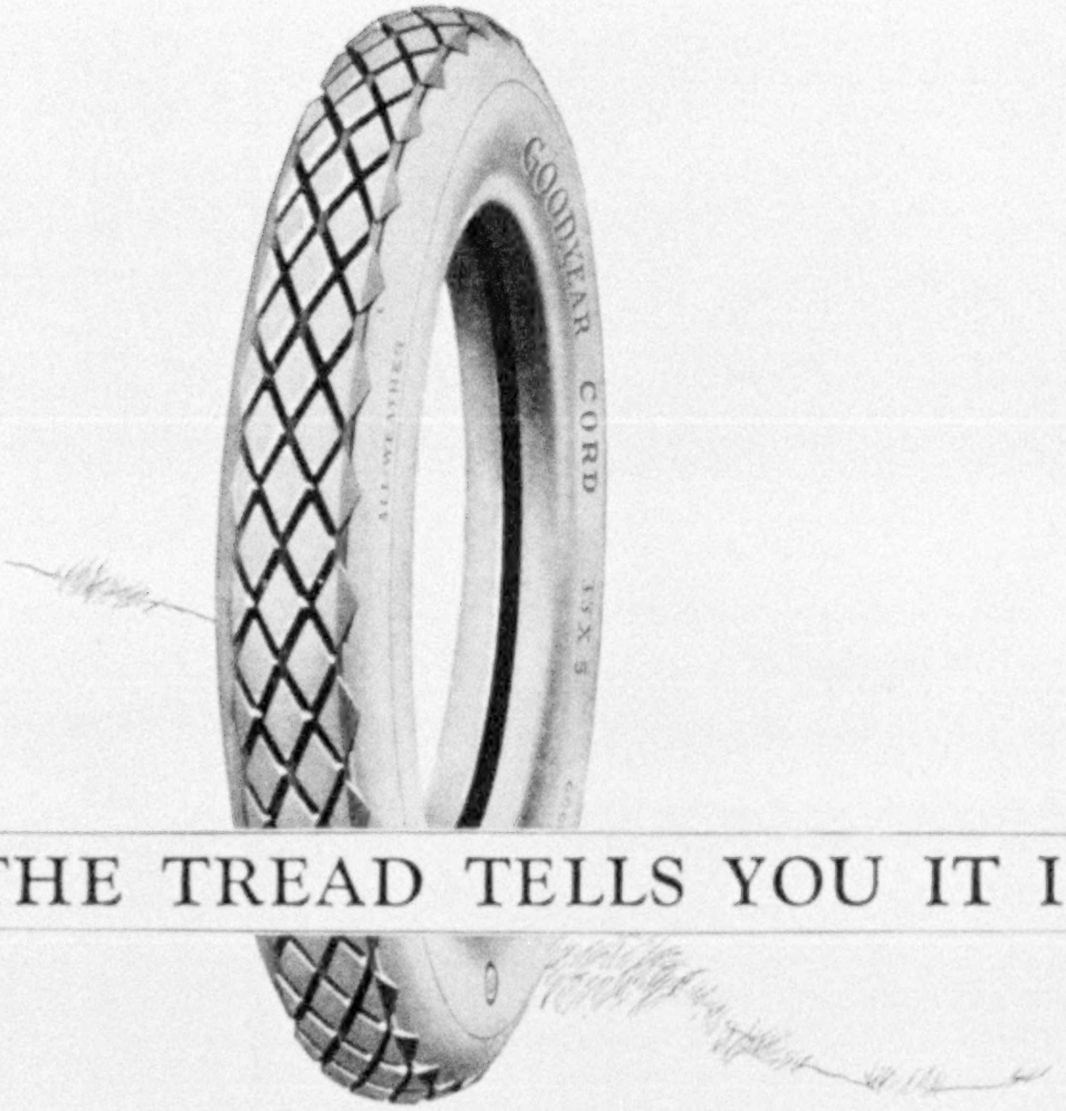


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You can tell the new Goodyear Cord Tire almost at a glance—by means of the beveled All-Weather Tread.

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*Goodyear Means Good Wear*

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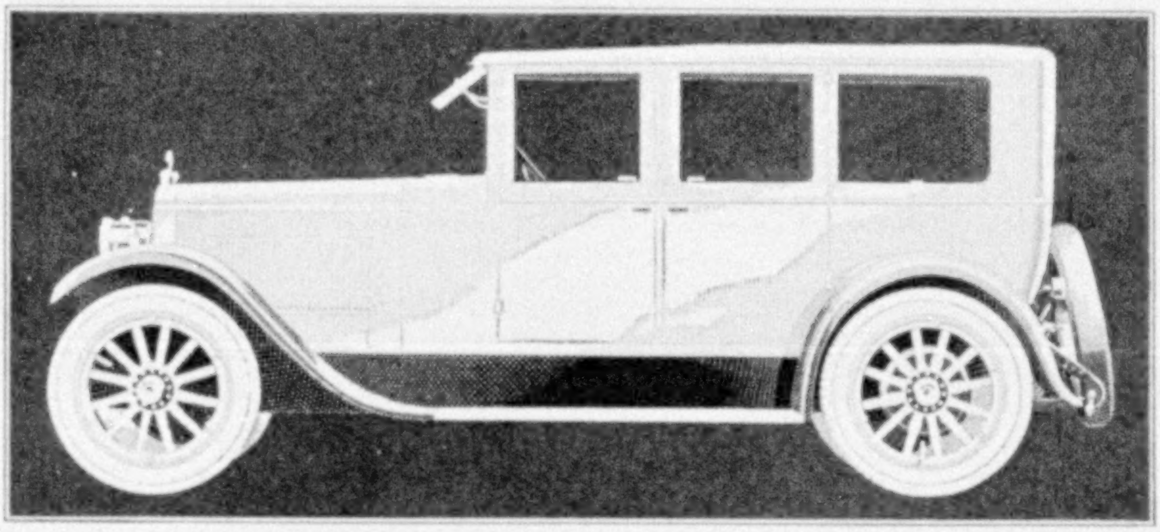

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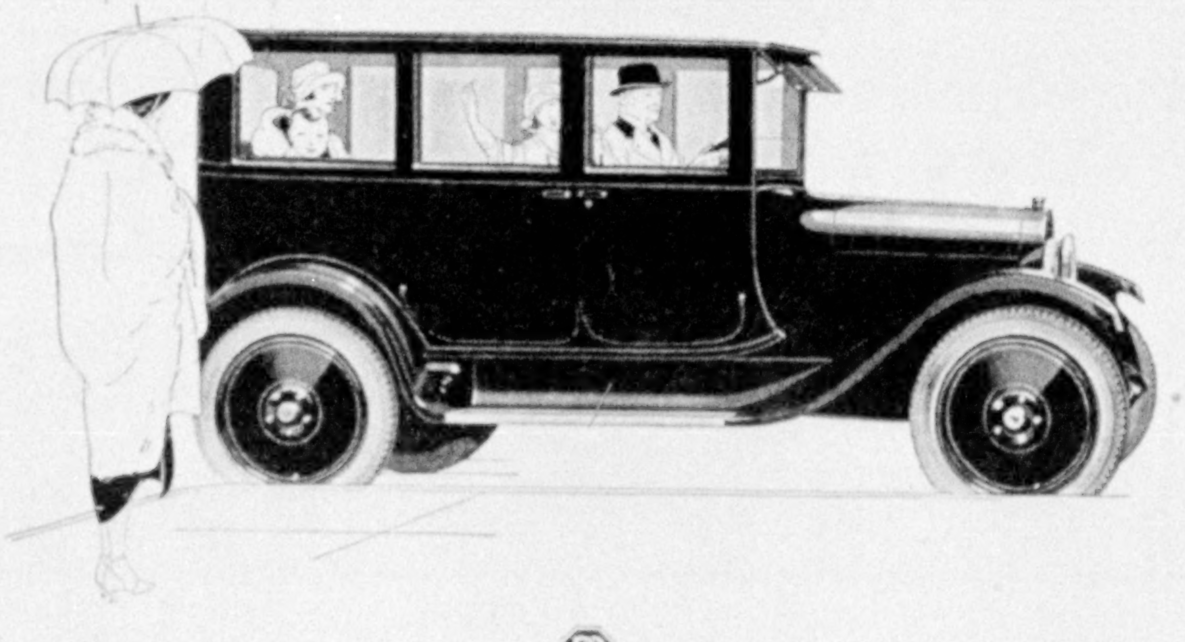
You sense it in the depth and comfort of the seats—richly upholstered in genuine mohair velvet. It makes itself known the instant you close the doors—which snap solidly shut, like the doors of a safe. It emanates unmistakably from every line and curve of the rugged body.

It becomes most evident when you discover that in smart company, where a car of less distinction would appear at its worst, Dodge Brothers Type-A Sedan appears at its best.

*The price is $1440 f. o. b. Detroit*



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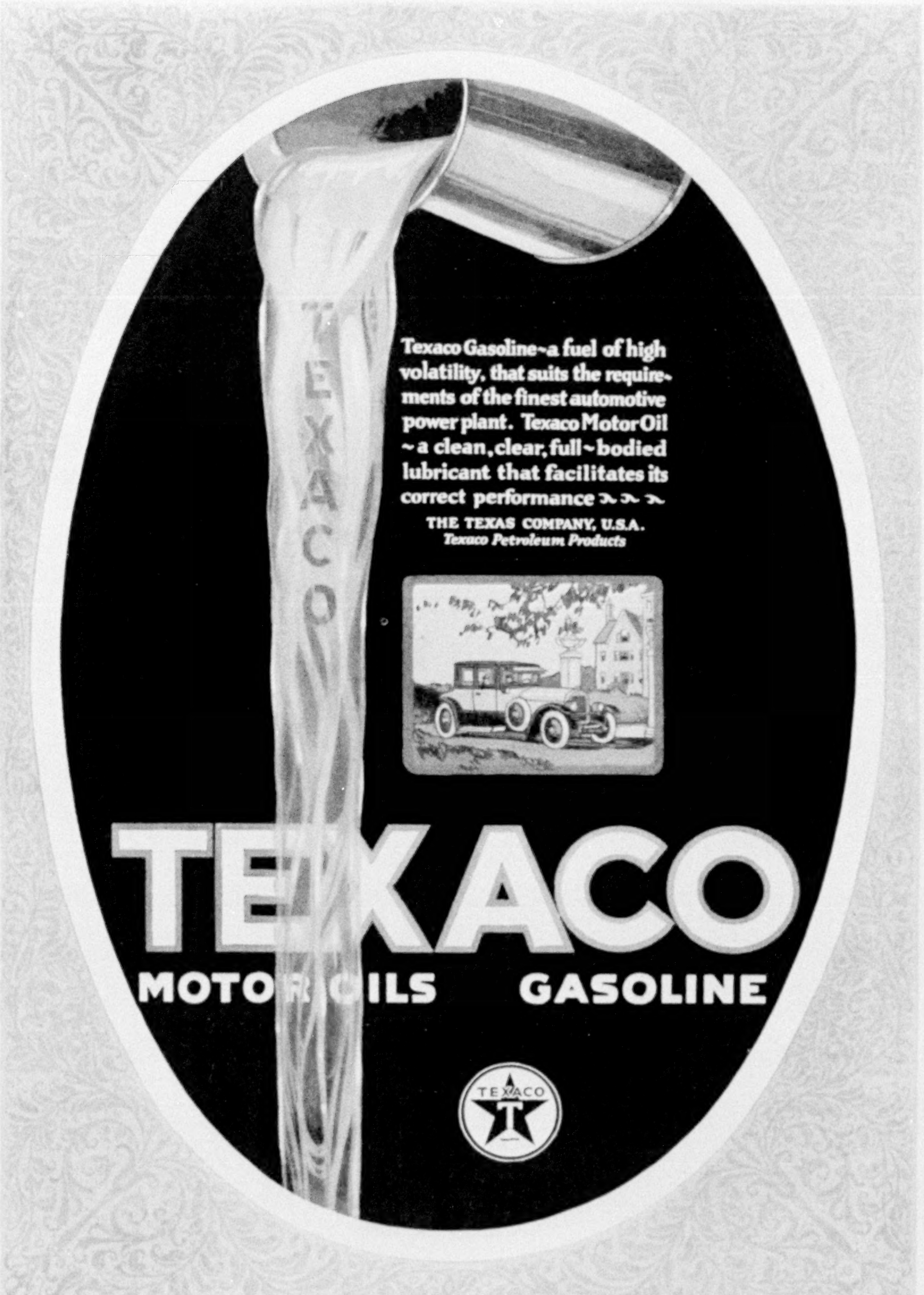
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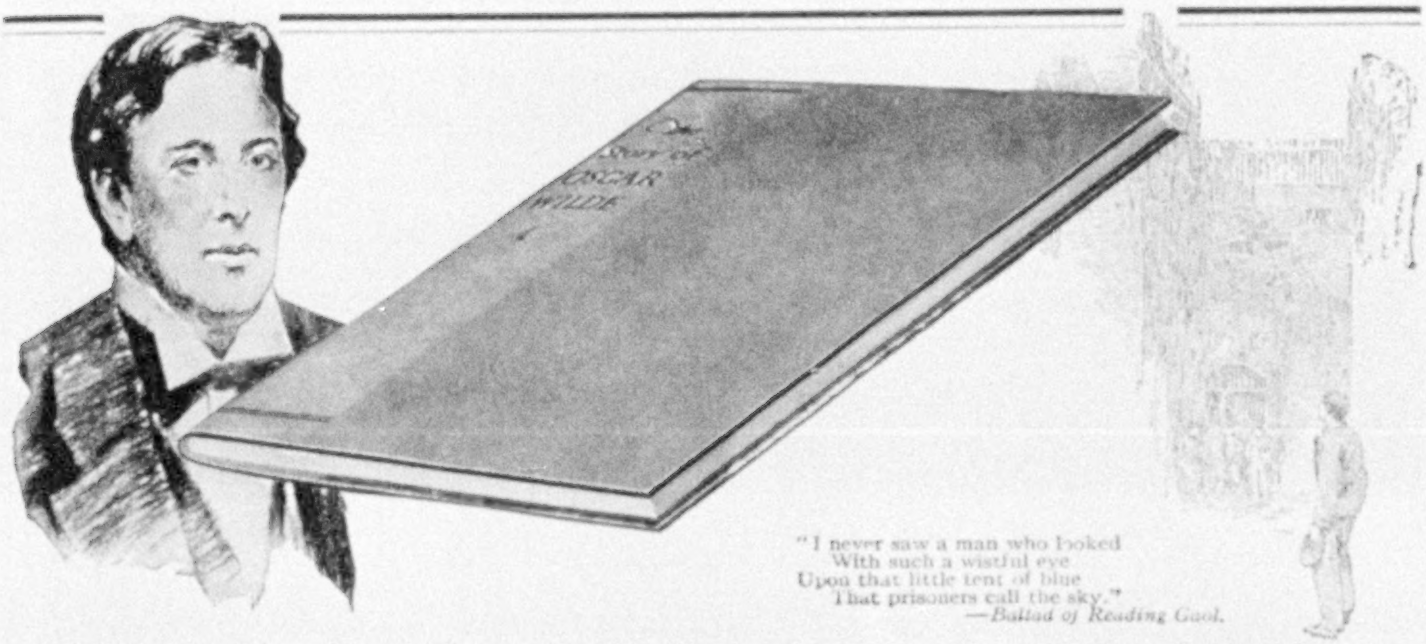


"I never saw a man who looked
With such a wistful eye
Upon that little tent of blue
That prisoners call the sky."
—*Ballad of Reading Gaol.*

# "The Story of Oscar Wilde"—FREE!

This fascinating brochure gives some idea of Wilde's sensational career; it contains "the most pathetic confession in all literature." You assume no obligation in sending for it. Read below why, for a short period, it is being distributed free.

"I FEAR I am dying as I lived, beyond my means," said Oscar Wilde, before he passed away. It was his last *bon mot*, so many of which have become famous and it was characteristic of his irrepressible good humor. He died with his name under a cloud, but not before he had written *De Profundis*, "a work that has no counterpart in English literature"; not before he had written *The Ballad of Reading Gaol*, which critics acclaim as the greatest ballad in the English language; not before he produced what dramatists themselves assert is the wittiest of all English comedies; not before he had written his haunting *Picture of Dorian Grey*, afterwards translated into seventeen languages; not before he had spun, for adults as well as children, some of the tenderest fairy tales written in all the ages. Never was there such a variegated genius as Oscar Wilde, and certainly never in the history of literature a more sensational career.

Wilde's case is parallel with that of Poe, DeMaupassant, Rousseau, Coleridge, DeQuincey, and many other great masters who lived within the shadows, but whose work is immortal. Since his death, there has been an unceasing and *ever-increasing* demand for his complete works.

In order adequately to meet this demand for Wilde's books among intelligent people, a new edition is in process that possesses two very unusual features. One is the distinguished company of famous men who have contributed introductions and fascinating reminiscences of Wilde. To list their names is enough. They are: Richard Le Gallienne, Padraic Colum, John Drinkwater, Sir Johnston Forbes-Robertson, Richard Butler Glaenzer, Coulson Kernahan, Michael Monahan, W. F. Morse, Walter Pater, John Cowper Powys, Edgar Saltus, Clifford Smyth, Arthur Symons, A. B. Walkley, and William Butler Yeats.

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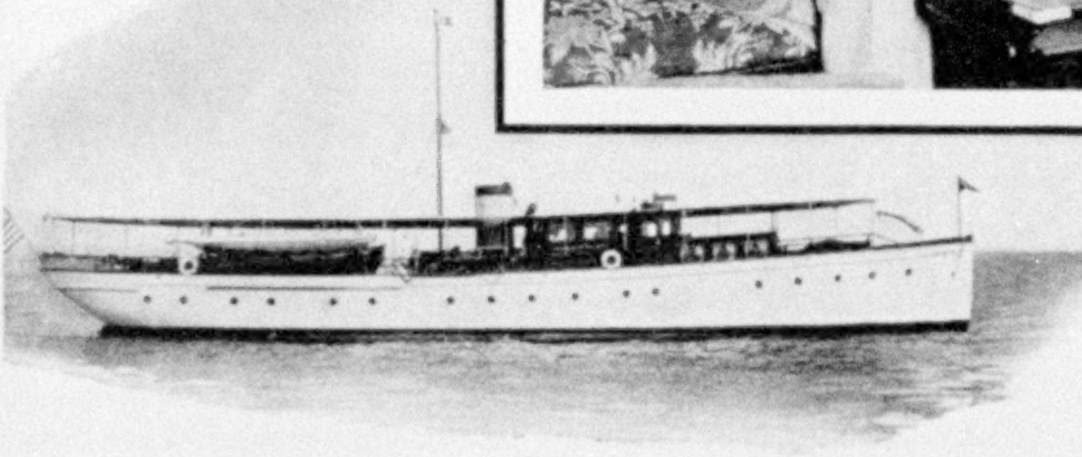
# Around the World with the Speejacks



*On the famous cruise of the Speejacks, Mrs. Gowen wrote up the log on a Remington Portable Typewriter*

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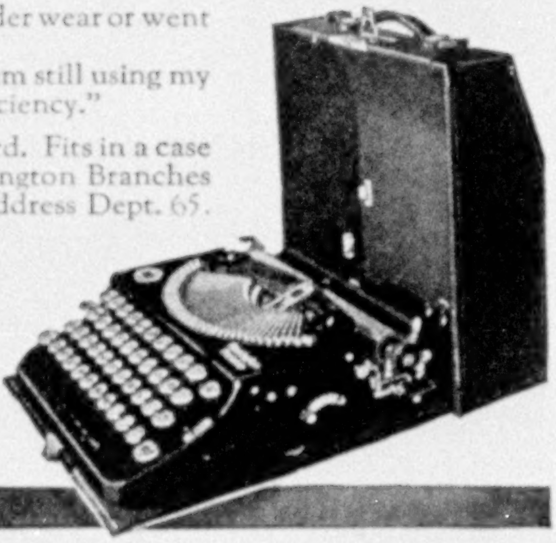

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*Mrs. Norris at her out-door grill under the redwoods*

# WHY I LIVE IN CALIFORNIA

## *by* KATHLEEN NORRIS

"A home in the mountains, with trees," decreed the legal head of the family. "An adjacent ocean, and isolation," added his fellow-worker with equal firmness. "A swimming-hole, a tennis-court, lots of fruit and extra beds for friends," demanded the juvenile voices, and from the kitchen came in inexorable, oriental tones a request for electric lights, hot water, accessible markets and traversable roads. So the little island off Victorio, Brazil, wouldn't do, and the pink villa upon an Italian hill wouldn't do, either. All very well for the joyous days of moving in, and sending home snap-shots of native servants and primitive arrangements. But cousins, aunts, uncles and grandparents are not in the habit of visiting either Brazil or northern Italy, and what is a home without arriving (and departing) cousins, aunts, uncles and grandparents?

Then came a casual visit to Saratoga, near San Francisco. Saratoga, every March, glorifies the high-tide of fruit blossom that washes over her like a snowy foam. Every year the little town goes mad with the joy of spring, the perfume and sunshine and birds, and every year all the neighboring towns pour in to join the festival.

We found other things in Saratoga. There's climate and carloads of prunes, and picnics in February and on Christmas Eve, and apricots, and the Egyptian corn that supports one family, and the Toggenberg—(is it?) goats that enable one woman—she told me—to put $7,000 in the bank in one year. There are out-of-door grills, and moonlight nights, and there is a glass-clear highway that ends at the Pacific, just an hour's run away.

When you say Saratoga elsewhere, it may suggest only potatoes. But when you say it in California all these things float before people's eyes, and first and foremost among them all come the fruit blossoms—the snowy, popcorny, upbubbling radiance of prune and apple and apricot and pear bloom!

That casual visit to Saratoga, in blossom time, settled the home question for the Norris family.

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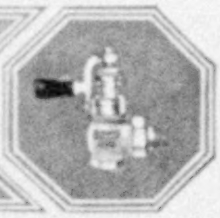
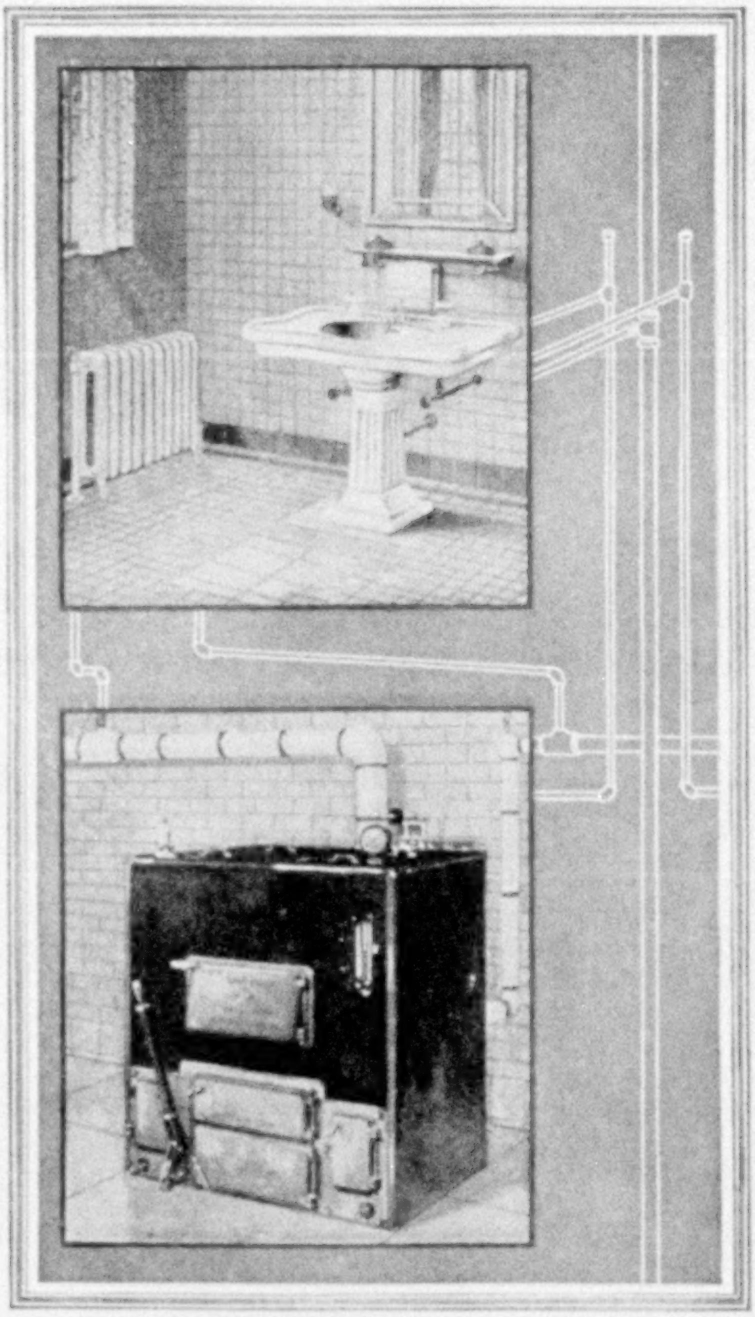


*Radiator Valve No. 231*



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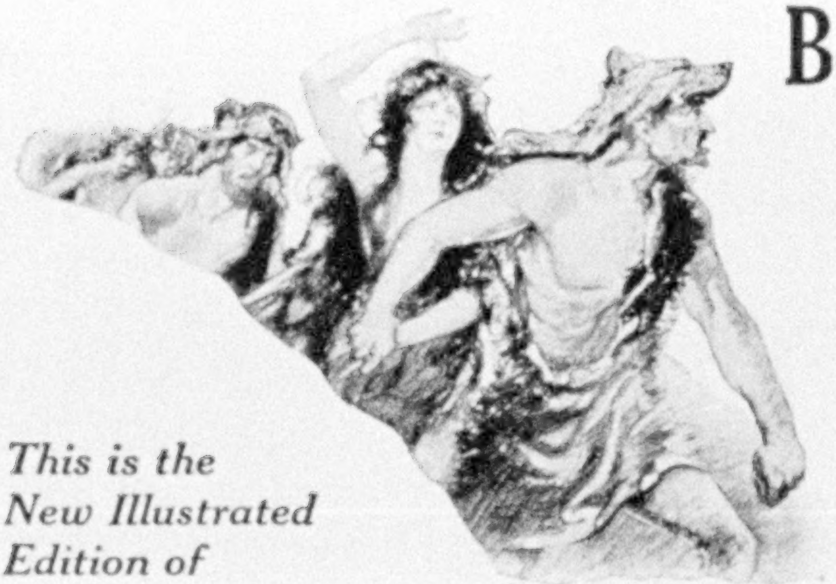

# Beyond the Dawn

Slowly a great procession winds down the hill—priests, fantastic in pelts and horns and horrible painted masks—a slim girl, wild-eyed, terrified.

Here, looking through the microscope of history, you see passing before you the birth of one of those strange religious cults, with secret initiations, and often cruel and obscene rites. It is a far cry from this through the long, slow climb of man to his present place.

H. G. Wells tells the whole story—its sordid beginnings, its gropings for light, its finding the path and losing it, until man, always bewildered, always stumbling, sometimes succeeding, stands where he is today, once more looking bewildered toward a newer day.

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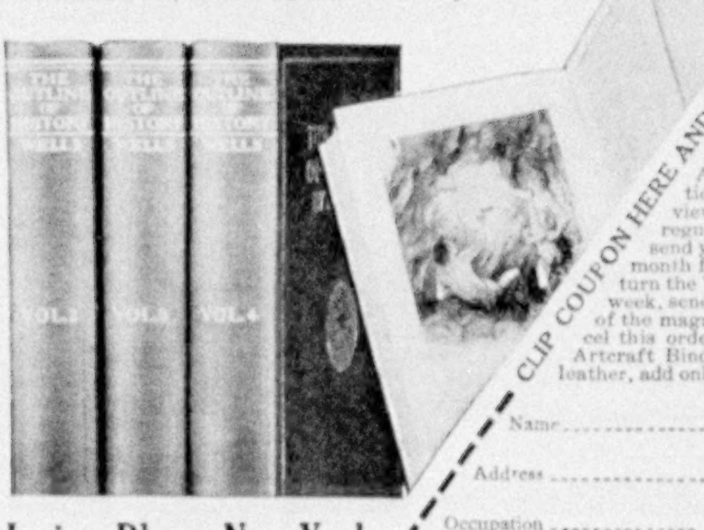

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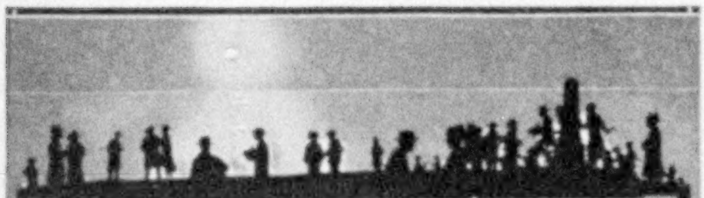

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In addition to the usual fascinating features of this Annual Summer Cruise, the 1923 program includes Iceland—Loen and Olden on the beautiful Nord Fjord—a trip to the vast Jostedalsbræ, the largest glacial field in Europe—Gothenburg and its Tercentennial Jubilee Exhibition. This delightful Cruise may be taken as a novel beginning of European travel. See Booklet for complete program and rates.

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# Different in a Thousand Ways

## —is this great summerland

*By* AN EASTERN BUSINESS MAN

SOUTHERN California is quite different than you may think it is *in summer*, for perhaps you, too, have thought of it as *too warm* in June, July and August.

I went there to a business meeting and stayed through July, sleeping under blankets every night.

And then, through curiosity, I looked up the records of summer temperatures and this is what I found:

The temperatures for 44 years—U. S. Government official readings in a great central city in Southern California are as follows:

Average mean temperature, 44 Junes..........66
Average mean temperature, 44 Julys..........70
Average mean temperature, 44 Augusts........71
Average mean temperature, 44 Septembers.....69

With that great summer weather summer visitors and vacation seekers there find the ideal summer playground of the United States—different in a thousand ways from any other place I ever saw.

It's worth while if you have only two weeks. *Change of scene*—that's what does you the good. Different country, different foliage, different sights everywhere, almost different people, they're so healthy and happy looking. You catch the same spirit and same look the first day you're there. It's "a little trip around the world" in a short time and at a cost that anybody can afford. I know no better way to invest some of my savings than in a great trip like this, for my family.

The palm trees, the snow-capped mountains, the orange groves, the old missions, the desert, the beaches, the big hotels, the canyons and the wonderful side trips by trolley or automobile amaze you. 4,000 miles of paved motor roads—and such places as they take you to! Unlike anything you've ever seen unless you've been to England, France, Switzerland and Italy.

There's big business there, too, to interest any man. The moving picture industry is a tremendous thing.

The variety of interests, entertainment, rest and recreation is almost unlimited. The golf courses are excellent to play on and beautiful to see.

And summer is the *rainless* season, so no matter what you plan today to do the next day or a certain day a month later you can do it as you planned.

Motor anywhere you want without rain or dust, and do it any time—even a *short* vacation is a good one because you always *get* it—weather never interferes.

These are the reasons why I like this section in the summer better than any other that I know.

You, too, will be enthusiastic when you've had the same fun there that my family and I have had.

Go this summer. That's my advice to people who want real change of scene and a new brand of fun.

At least find out how comfortable, interesting and inexpensive this great trip is. The *round-trip fares* on all the transcontinental railroads during the summer between May and October, are only a little more than the *usual one way* fare. Your local railroad ticket agent can tell you. Or forward coupon. Find out now. Then go there and find a summer wonderland.

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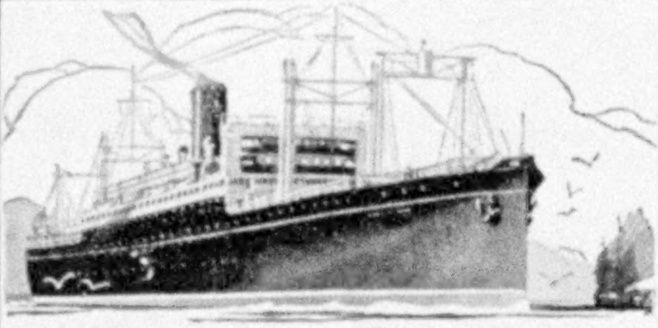

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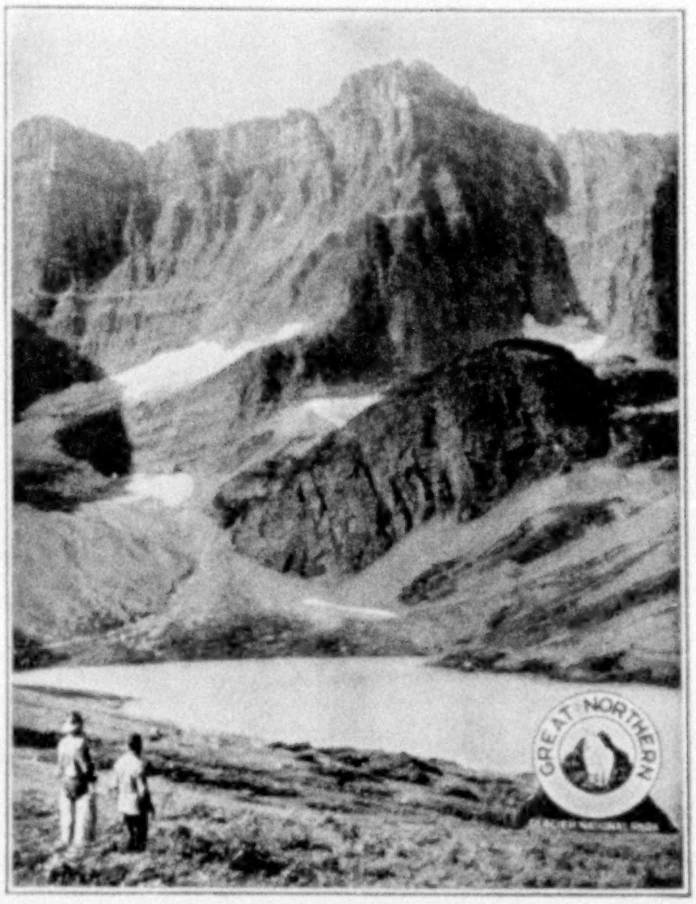


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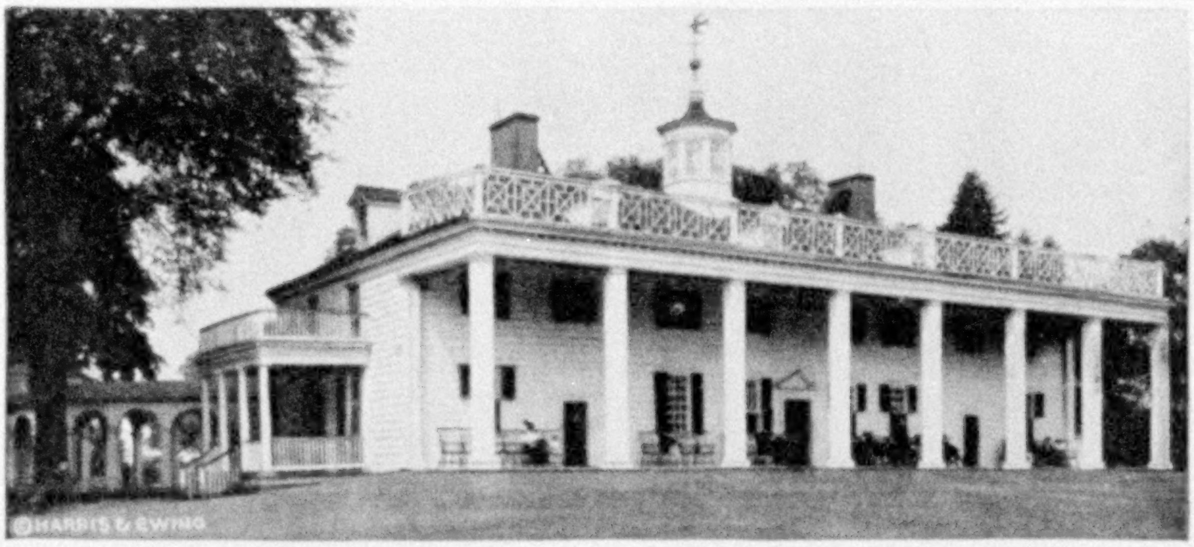


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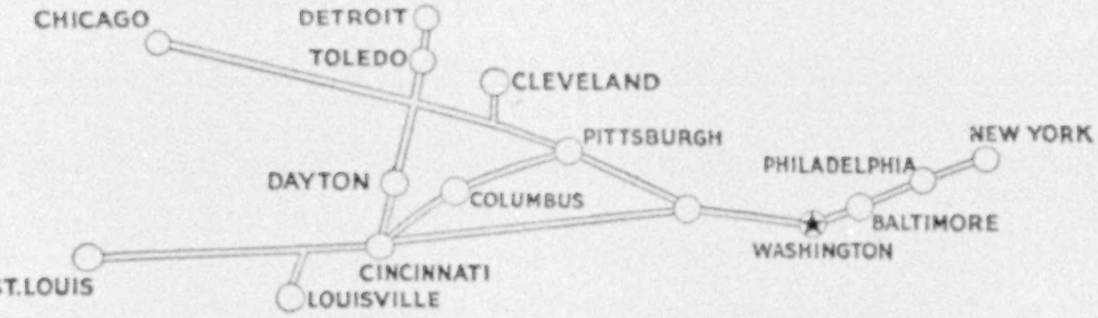


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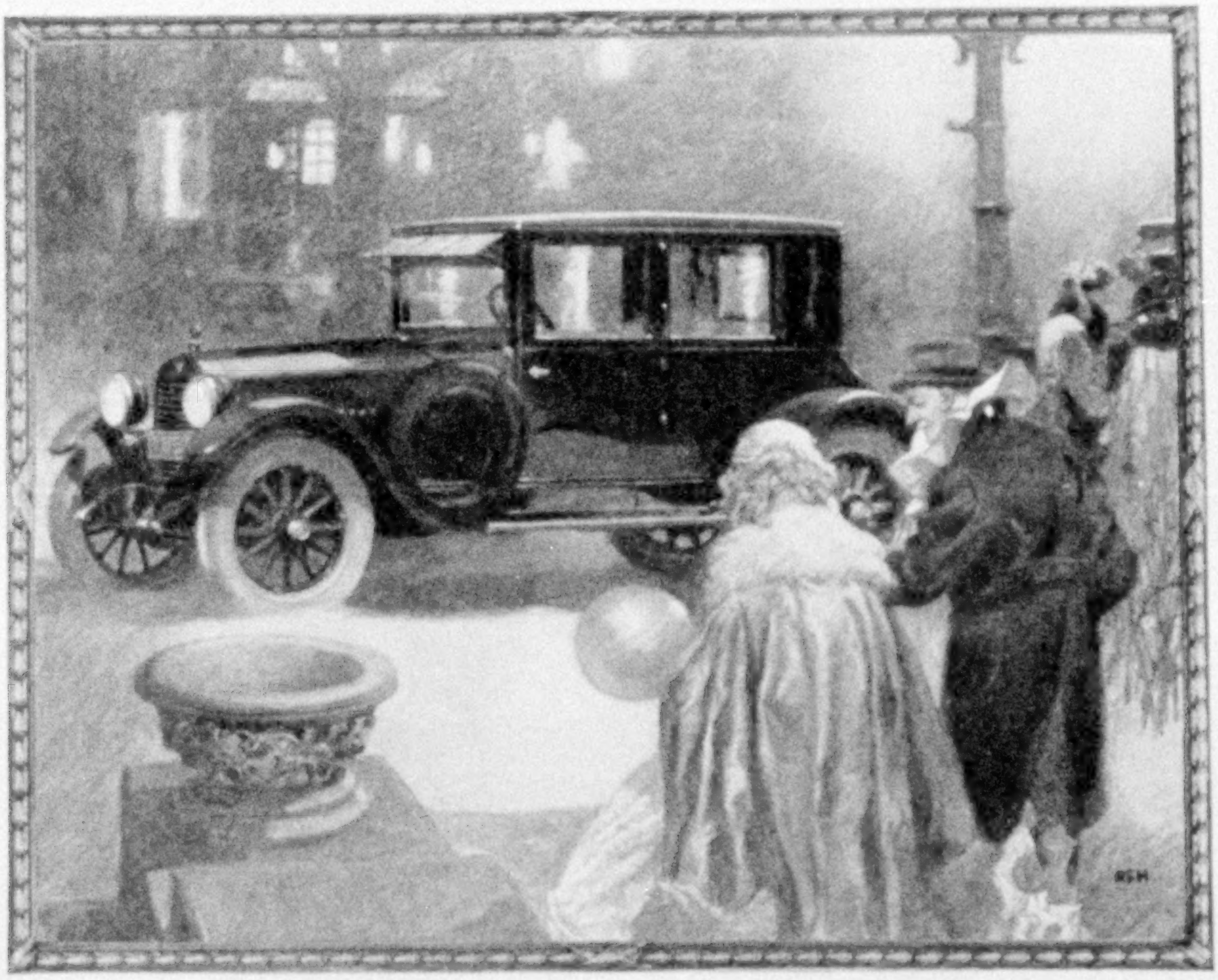

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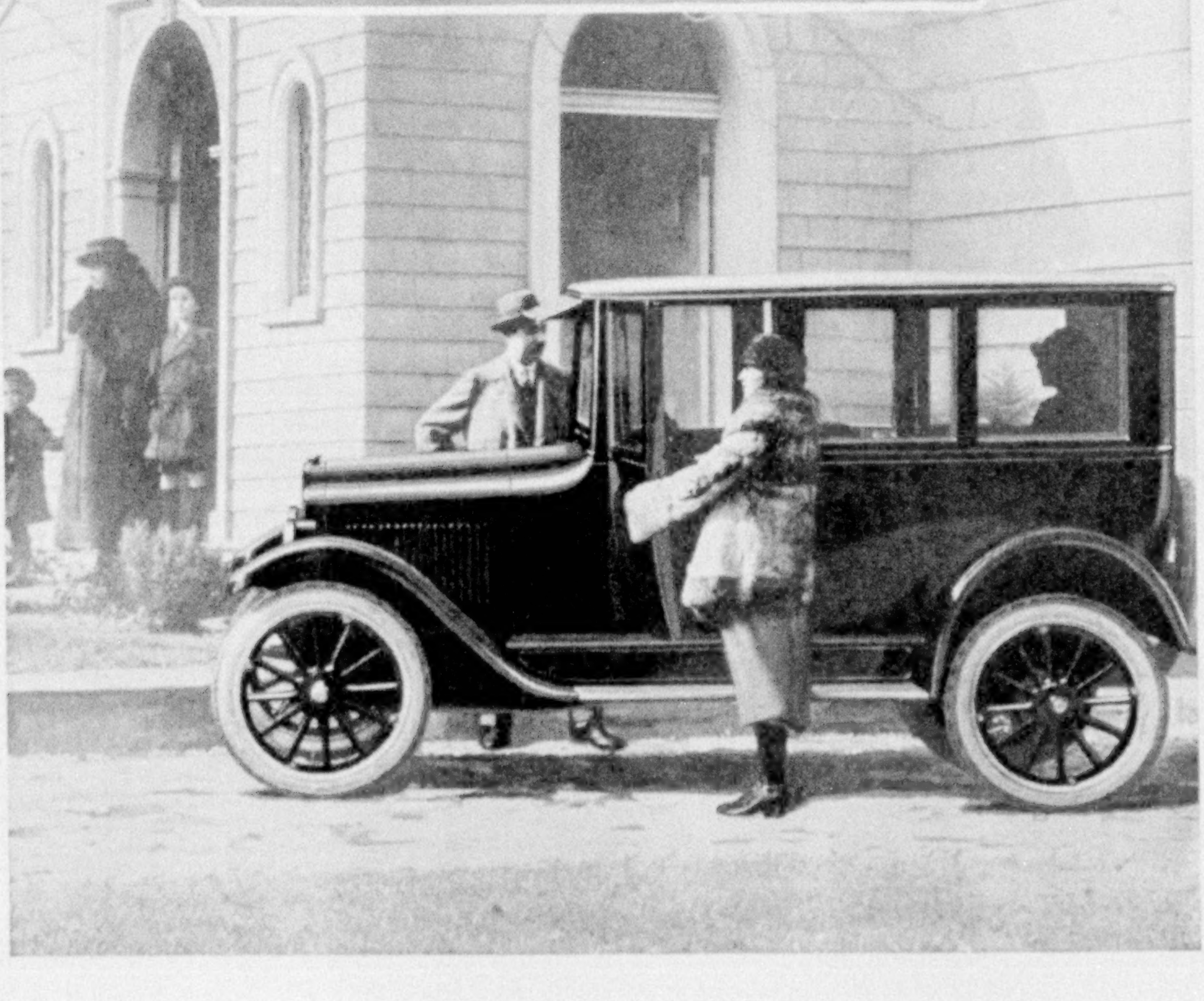

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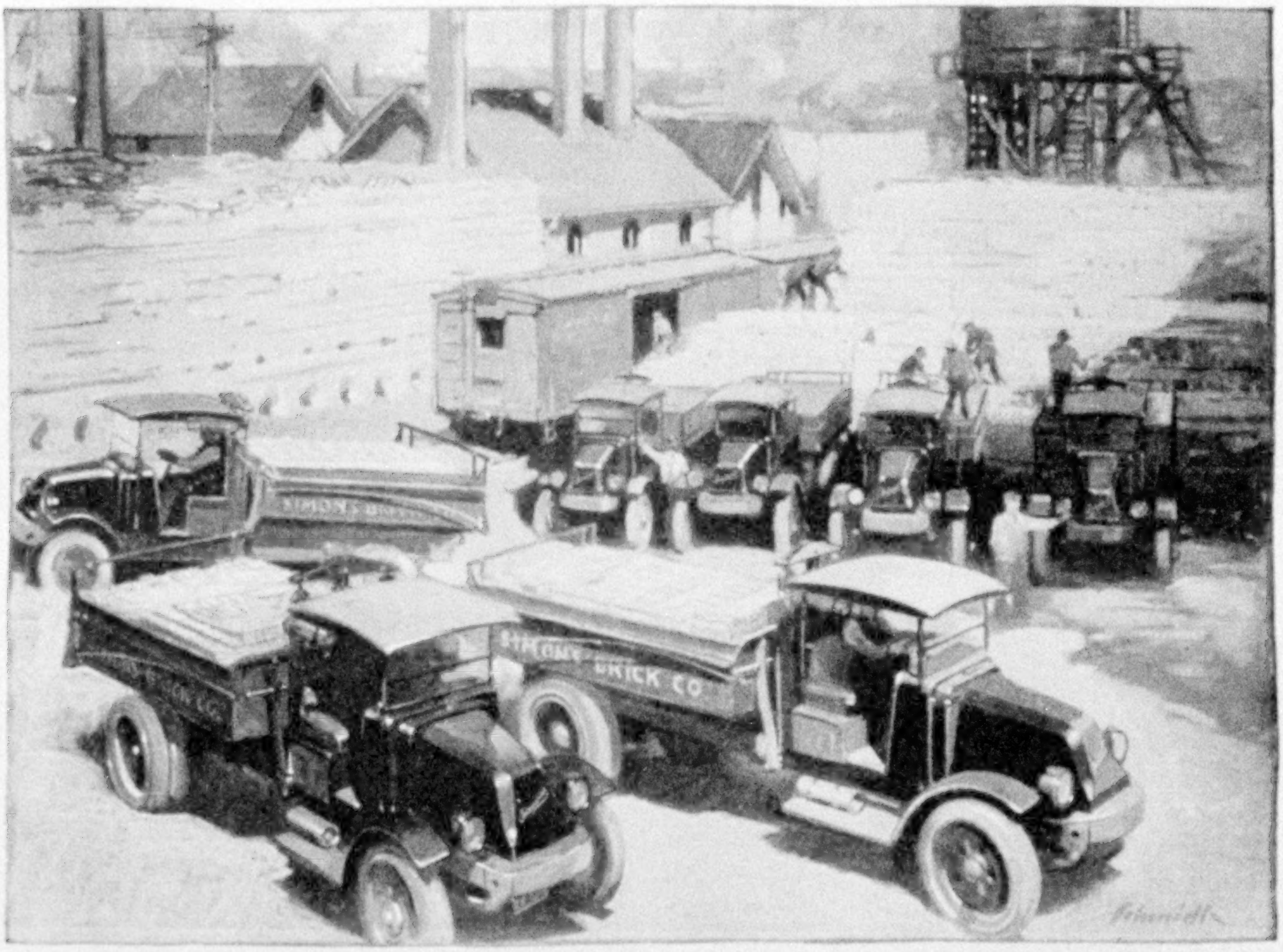

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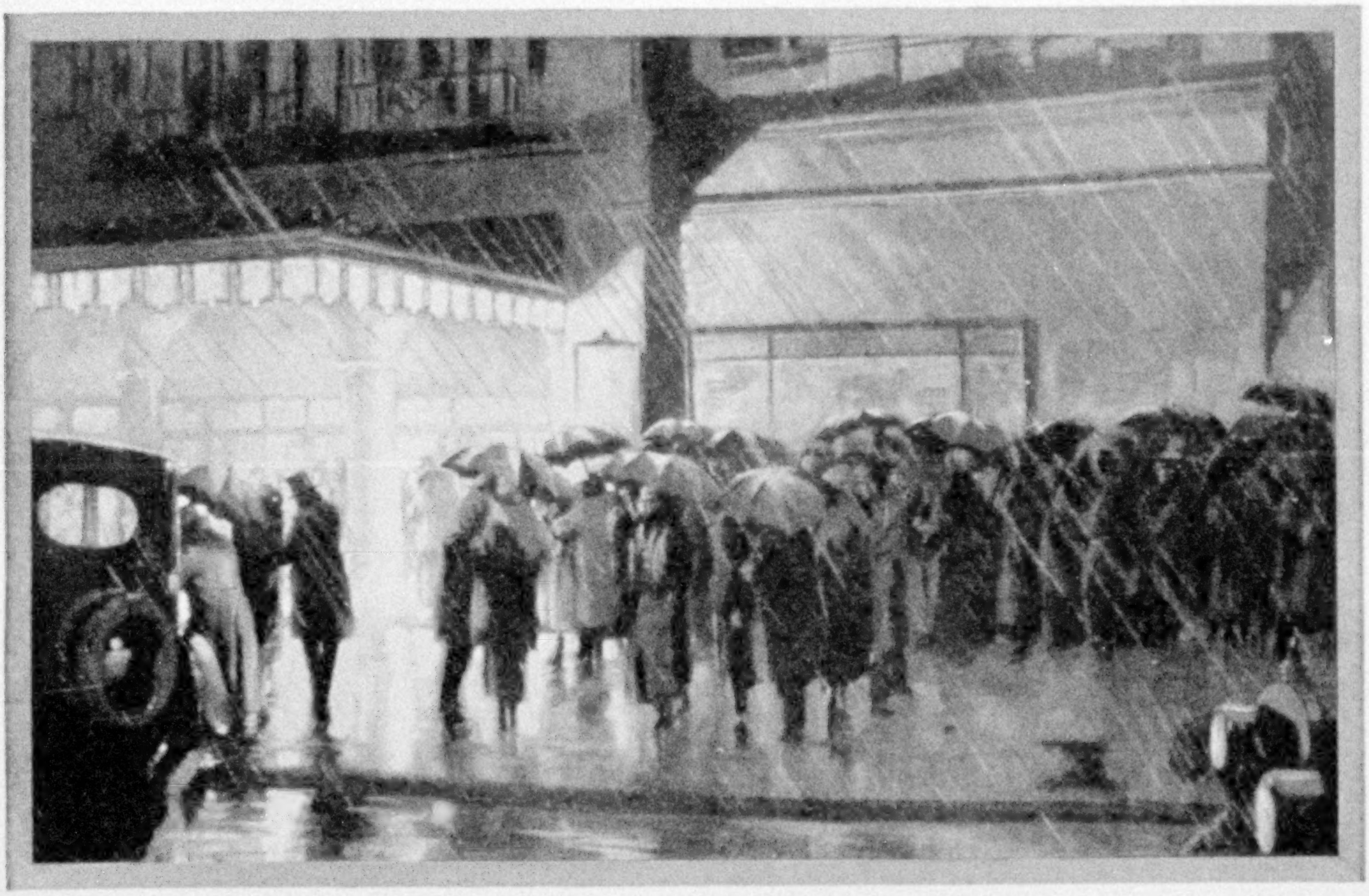

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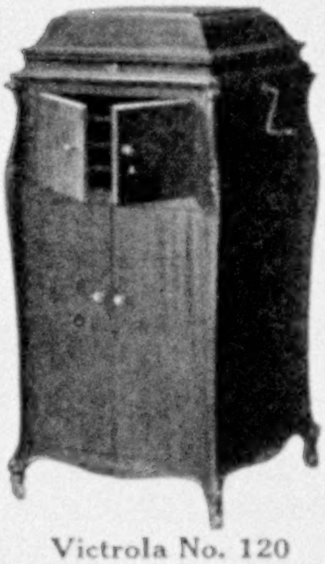

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Vol. XLIII, No. 4 WASHINGTON April, 1923

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# MASSACHUSETTS AND ITS POSITION IN THE LIFE OF THE NATION*

By Calvin Coolidge

Vice-President of the United States

THE place of Massachusetts in the life of the nation has been made by continuing adherence to fundamental principles. This unchanging attitude raised her to primacy in the long struggle for individual liberty and local self-government.

The background of her early people peculiarly fitted them for this leadership. They were possessed of an experience, training, and tradition in the art of government which was surpassing. It reached back behind the veil of myth and mystery.

While other peoples turned aside, that stock which settled New England, both by reason of their character and environment, swept on from the tribal customs beyond the North Sea to the foremost achievement in human relationship, the Republic of America.

The Pilgrims and Puritans did not come hither empty-handed. They brought with them a perfected conception of rational liberty under the orderly process of public law.

They had a clear idea of established rights, duly defined and recorded. The heritage which they claimed, that privilege of birth which they had marked out for themselves, was not an estate measured merely by lands and tangible possessions, but a heritage unaffected by these, dowered by inalienable rights of which no government and no power could dispossess or despoil them.

*An address delivered before the National Geographic Society, in Washington, D. C., on February 2, 1923.

This estate they had claimed from days of old. It had been set out in charters, not unstained by the blood of the people, which bore the sanctions of parliaments and the seals of kings.

It had been enacted into the statute law of the realm. It carried the approbation and authority of a long line of judicial decisions. But it derived a dominion which surpassed all these, from the unalterable convictions of a great people, who had the courage and genius to make whatever sacrifice was necessary to follow right and truth to their logical conclusions.

### FOUNDERS BELIEVED IN SUPREMACY OF THE PEOPLE

These founding fathers came of a race which was not without a conception of the supremacy of the people. They had a clear idea of chartered liberty. They understood the principle of parliamentary government and royal authority acting within definite limitations. They were familiar with the jury system and enforcement of civil and criminal liabilities in accordance with existing laws.

The immediate cause of the settlement of Massachusetts was a profound religious movement. Greene tells us that in the age of Elizabeth England became a country of one book; and that book was the Bible. When the people took that book into their hands, the right of personal judgment in matters of religion became established, and from this there was derived the principle of personal judgment

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FANEUIL HALL AND QUINCY MARKET, IN BOSTON

This building is often called the Cradle of American Liberty because in it were made many of the eloquent speeches which helped to bring about the American Revolution.

in matters of government. The conclusion of the whole matter was individual liberty.

A KING'S THREAT CAUSED FOUNDING OF MASSACHUSETTS

This did not occur all at once. Toleration is not a self-evident truth. Wherever power is lodged in a monarch, always he has sought to maintain and extend it by encroachment upon the liberties of the people.

When the more advanced of the Puritans sought to put their principle of freedom into practical effect by separation from the established church, they were met by the notorious threat of the king that he would make them conform or he would harry them out of the land.

In that threat lay the foundation of Massachusetts. That little band, from among whom were to come those made forever immortal by that voyage of the *Mayflower*, sought refuge in Holland, where, under the protection of William the Silent, the conscience of man was free. What manner of men they were, what ideals they cherished, are described to us by their pastor, John Robinson.

"The people," said he, "are industrious and frugal. We are knit together as a body in a most sacred covenant of the Lord, of the violation whereof we make great conscience, and by virtue whereof we hold ourselves strictly tied to all care of each other's good and of the whole by everyone, and so mutually. It is not with us as with men whom small things can discourage."

In that simple statement is to be found the principle of prosperity, responsibility, and social welfare, all based on religion.

PRIDE OF RACE MADE THEM PILGRIMS

A pride of race and of language determined them to seek out a location for themselves where they would be equally free and where they would not be in jeopardy of losing their identity through being absorbed in an overwhelming mass of people.

They were of humble origin. The bare necessities of existence had been won by them in a strange country only at the expense of extreme toil and hardship. They did not shrink from the prospect of a like experience in America.

"They knew they were Pilgrims," said Robinson, "and looked not much on those things, but lifted up their eyes to heaven, their dearest country, and quieted their spirits."

Such was the sentiment cherished by those who were setting out to exert so large an influence in the building of the most powerful empire which the world has ever seen.

They left behind their old pastor, John Robinson, a great man possessed of a great vision and inspired by great piety, not only a clergyman but a statesman.

Winslow reports that in his final charge to this congregation he told them: "If God reveal anything to us by any other instrument of His, to be as ready to receive it as ever we were to receive any truth by his ministry, for he was very confident the Lord had more truth and light yet to break forth out of His Holy Word"—an admonition to keep an open mind, an expression of firm belief in progress.

It was such a people, strengthened by such a purpose, obedient to such a message, who set their course in the little *Mayflower* across the broad Atlantic on the sixth day of September, 1620, old style, which is celebrated under the new calendar as Marne Day.

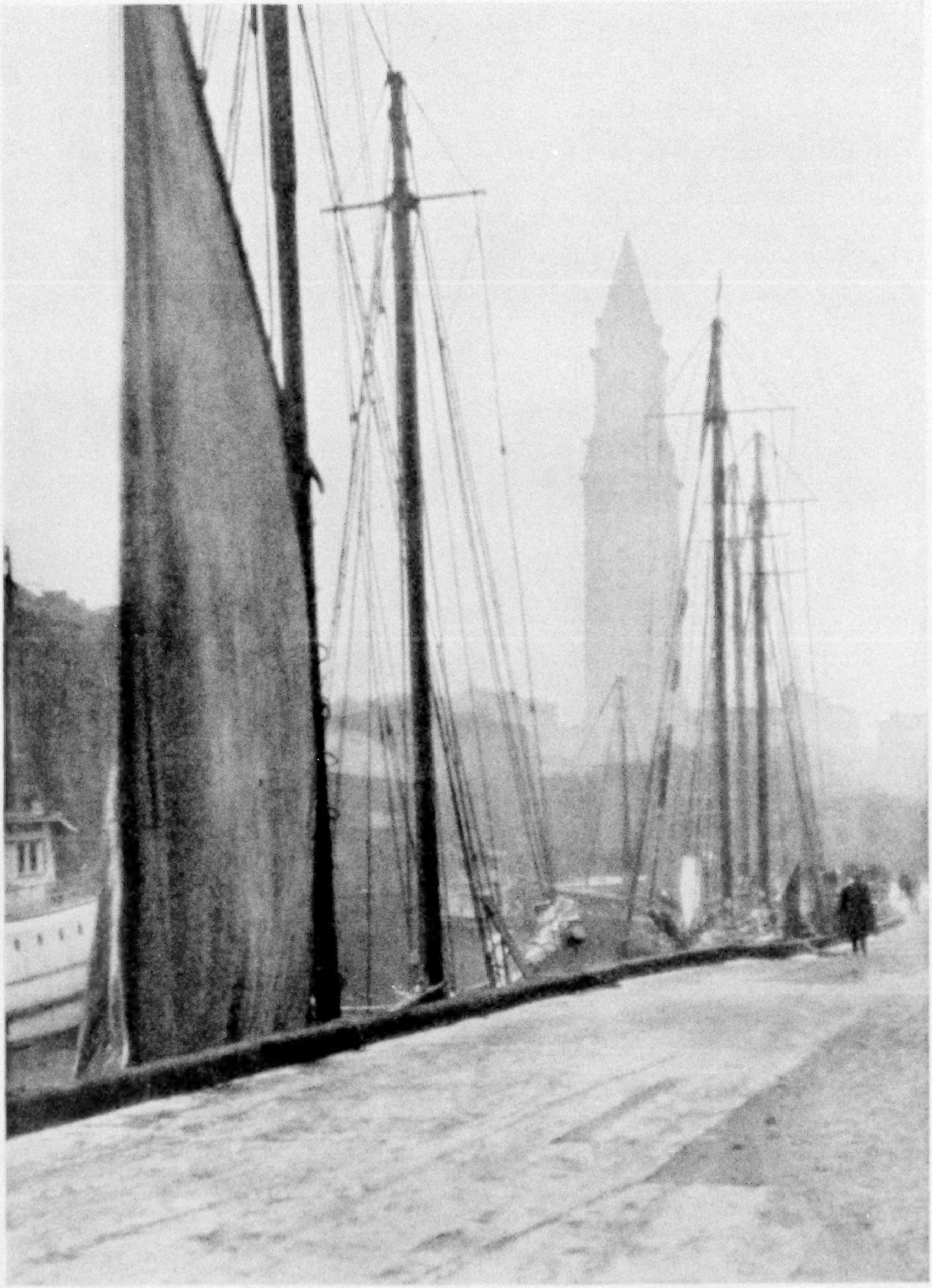
THEY WERE SEEKING A SITE ON THE DELAWARE RIVER

The country they sought lay around the Delaware River, which was under the charter of the London Company, from which they had secured a grant of land. A providential breeze carried them far to the north, while storms and the frail condition of their ship prevented them from continuing to their destination.

They came to anchor off Provincetown, far outside the jurisdiction of their own patent and the authority of existing laws.

Undismayed, they set about to establish their own institutions and recognize their own civil authority.

Gathering in the narrow cabin of the *Mayflower*, piously imploring the divine presence, in mutual covenant they acknowledged the power "to enacte, constitute, & frame just & equall lawes, ordinances, actes, constitutions & offices," to which they pledged "all due submission & obedience."



Photograph by Herbert B. Turner

THE WHARF OF THE FAMOUS TEA PARTY, IN BOSTON HARBOR

On the evening of December 16, 1773, occurred that romantic incident of throwing overboard, into Boston Harbor waters, the tea upon which the Colonials refused to pay a tax.

So there was adopted the famous *Mayflower* Compact. It did not in form establish a government, but it declared the authority to establish a government, the power to make laws, and the duty to obey them. Beyond this it proclaimed the principle of democracy.

The powers which they proposed to exercise arose directly from the express consent of all the governed.

The date of this document, remarkable for what it contains, but more remarkable still because it reveals the capacity and spirit of those who made it, is November 11, 1620, old style; under the new calendar it is destined long to be remembered as Armistice Day.

Such was the beginning of Massachusetts, men and women humble in position, few in numbers, seemingly weak, but possessed of a purpose, moved by a deep conviction, guided by an abiding spirit against which both time and death were powerless.

It is said that upon the old Colony of Plymouth there is no stain of bigoted persecution. They carried with them the atmosphere of holy charity. Their efforts and their experience stand forth distinctly, raising a new hope in the world.

### PURITAN COLONY WORKED OUT INSTITUTIONS OF THE COMMONWEALTH

They were soon to be reinforced by the great Puritan migration, which established a vigorous colony at their north, known as the Company of Massachusetts Bay.

It was among them that there was worked out more in detail the fundamental institutions of the old Commonwealth. They had a royal charter, granted in 1629, which provided for a Governor, a Deputy Governor, and a Council of eighteen Assistants, annually to be chosen by the Company.

They were likewise given authority to make laws for the government of the settlers, provided they did not conflict with those of England. Here there came into existence the frame of a miniature republic.

One of the main objects of this movement was to provide a retreat for those of Puritan faith in case they were overwhelmed at home by the rising tide of despotism of Charles the First.

For this purpose men of such prominence as Winthrop and Dudley and their associates came to the new colony, transferring with them the location of the government. Congregations and clergymen followed.

With the arrival of thousands of people churches and towns were established and there began the making of American constitutional history.

These people were of the Puritans. What they have wrought in the old world and the new is known of all men. Their prime motive was self-mastery. To them the great reality was the unseen world.

They had a high disdain for every assumption of earthly authority, whether exercised in the name of the state or of the church. They were guided by the inner life. They rebelled against all government by others, but were humbly solicitous to govern themselves.

With that same intensity of spirit with which they scorned kings and bishops, they reverenced the authority which came from on High. They trampled under foot and destroyed despotism in England, but they raised up and established freedom in America.

It was these people, moved by such convictions, that from the day of her settlement guaranteed that Massachusetts should be grandly placed in history. The Puritan spirit has always worked toward freedom and independence in all things.

Its ultimate goal has not always first been reached within the domain of that Commonwealth. There have been times when it has seemed to be denied by some of her own people, but the foundation of it was laid there. The ultimate support for its progress has ever been found there.

If, occasionally, she has been outstripped by those who have gone out from her in the practical application of this spirit which her entire history has illustrated, it is but just to remember that there was located the American source of the original inspiration.

The Puritans cherished as their immediate purpose not a broad latitude in either religious or political life. Their chief thought was to escape from the intolerable tyranny of Charles and of Laud. If they were to maintain their safety against the Indians, or their freedom against the King, it was necessary to maintain solidarity in all things.

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NORTH BRIDGE AND THE STATUE OF THE "MINUTE MAN" ON CONCORD'S BATTLE GROUND

Beneath the new bridge which has taken the place of the "rude bridge that arched the flood," of Emerson's poem, the stream flows with the same sereneness that it did on that April day when "the embattl'd farmers stood, and fired the shot heard round the world."

They could not tolerate those who would set over them a tyranny in church or state, or those who by a division of council lessened the military or political resistance of a weak and exposed outpost.

When to the colony toleration meant extermination, they rejected it, but they held to principles, which, when they had the strength broadly to apply them, led to greater and greater freedom.

The leading clergy and many of the Puritans belonged to the established church, yet on reaching Massachusetts they naturally became separatists under the Congregational form of church government.

Religion was their first thought. They at once built places of worship and formed church societies on the principle that each congregation was free and independent.

Photograph by Notman

THE MAIN GATEWAY TO "FAIR HARVARD," WHICH WAS FOUNDED IN 1636

Upon this gate are recorded the feelings of those early Americans concerning education: "After God had carried vs safe to New England, and wee had bvilded ovr hovses, provided necessaries for ovr livelihood, reard convenient places for Gods worship, and setled the civill government, one of the next things we longed for and looked after was to advance learning and perpetvate it to posterity." The building is Harvard Hall, built in 1765 and occupied by troops during the Revolutionary War.

While the early magistrates and clergy were divided between the principle of aristocracy and democracy in the government of church and state, the people themselves held to the principle of democracy with a sturdy and unswerving tenacity.

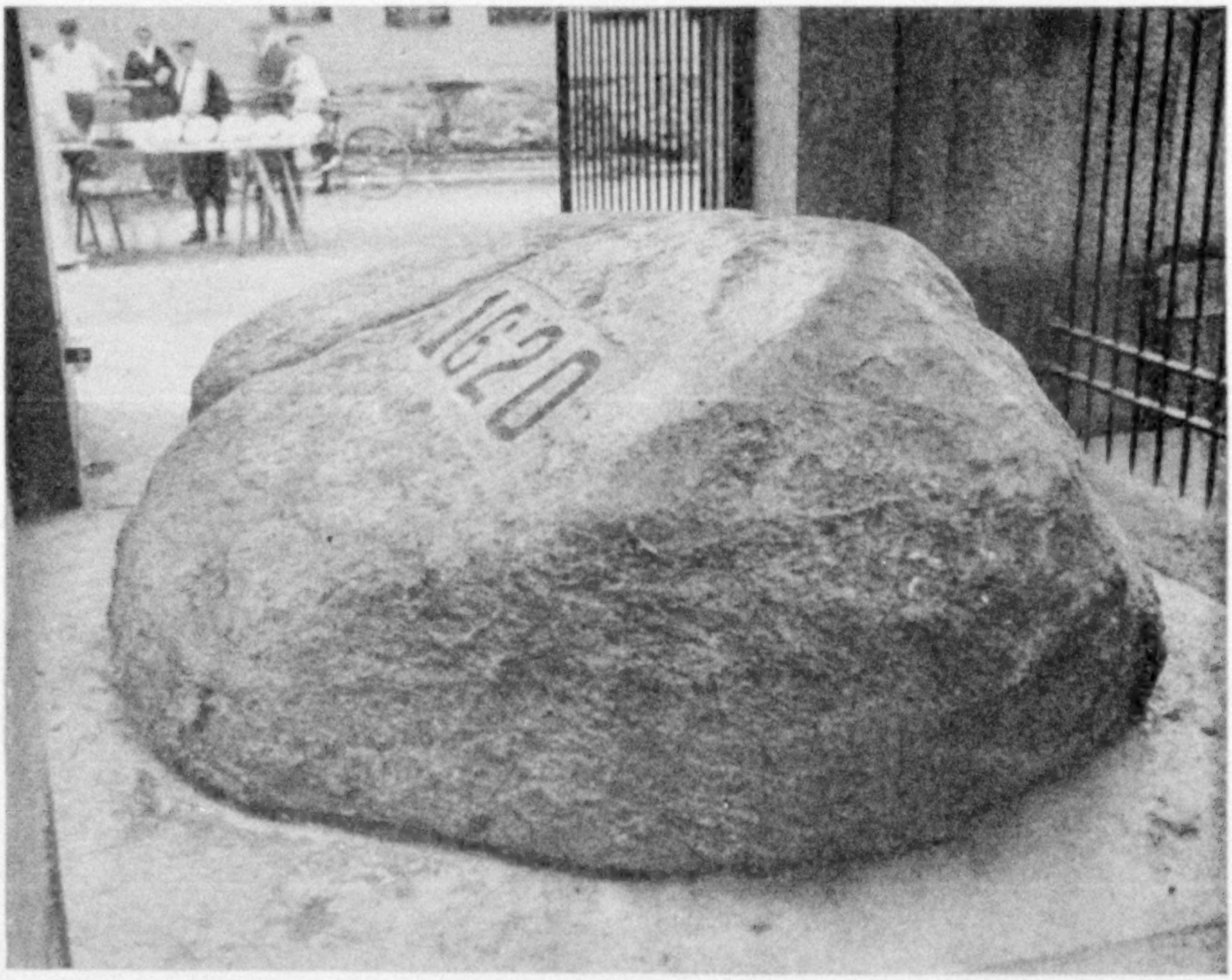
It was the view of Governor Winthrop that "the best part is always the less, and of that best part the wiser part is always the lesser," while the most eminent clergyman of the Colony, John Cotton, probably voiced the opinion of the majority of the profession when he declared he did not conceive democracy "as a fit government either for church or commonwealth."

These views were more than balanced by such men as Sir Harry Vane, who was chosen Governor in 1636, a liberal to the point of toleration, and who returned to England to stand on the side of liberty in the great rebellion and propose a settlement of government under Cromwell which would have been on the pattern of the American republic.

### HOW CONNECTICUT WAS ESTABLISHED

Of a like mind was Thomas Hooker, pastor of the church at Cambridge, who was later to tell Winthrop that "in matters which concern the common good, a general council, chosen by all, to transact businesses which concern all, I conceive most suitable to rule and most safe for relief of the whole."

It was he and his congregation which moved through the wilderness to establish Hartford. It was there he preached that remarkable sermon in which he announced that "the foundation of authority is laid, firstly in the free consent of

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MASSACHUSETTS' ROCK OF AGES: THE FAMOUS ROCK AT PLYMOUTH

After having wandered around Plymouth from one stopping-place to another, this historic rock now rests beneath a handsome stone canopy before Cole's Hill, the first burial ground of the Pilgrims. The bones of some of these early adventurers have been placed in the canopy above the rock.

the people," and saw at once that doctrine completely recognized and established in the free republic under a written constitution of the Colony of Connecticut.

Such was the first offspring of the Puritan spirit of Massachusetts. It was possessed of a vitality capable of creating a political structure of great strength and forming free institutions wherever it might go.

The democratic attitude of the people was very early apparent. The freemen of the colony at first undertook in public meeting to administer its affairs. When numbers made this impossible, the authority was lodged with the Board of Assistants to make laws and elect the Governor.

But when the inhabitants of Watertown hesitated to pay a small tax which was levied for public defense in 1631, on the ground that English freemen could not be taxed without their consent, the result of the agitation which then arose restored to the freemen the right to elect the Governor and gave to each settlement the right to choose their own deputies to a general court.

As early as 1644, these deputies, withdrawing from the assistants and forming a second house, became a coördinate branch of the legislature.

Thus the principle of representative government was developed at once for the purpose of safeguarding the liberties of the people.

To gain that end, no more capable instrument has been devised by man. It is scarcely too much to say that while the general court then established has sometimes ceased to sit, it has never ceased to exist. From that day to this, in Massachusetts it has been the chief repository of the powers of government.

For a period of more than fifty years the Commonwealth was administered under this liberal charter, virtually independent and self-governing in all its affairs, a political training never ceasing, the results of which have been worldwide.

### THE FOUNDING OF HARVARD

The church having been formed and the government organized, the next thought was of education. An early report states: "One of the next things we longed for and looked after was to advance learning and perpetuate it to posterity, dreading to have an illiterate ministry to the churches when our present ministers shall lie in dust."

In 1636, in order that "the commonwealth be furnished with knowing and understanding men, and the churches with an able ministery," the General Court voted that it "agrees to give four hundred pounds toward a school or college, whereof two hundred pounds shall be paid the next year and two hundred pounds when the work is finished."

Quincy claims that this assembly was "the first body in which the people, by their representatives, ever gave their own money to found a place of education." Two years later the legacy of a library and seven hundred pounds from John Harvard determined the name of the college.

Conscious of their own purpose, viewing their own accomplishments, believing they were instruments of a divine destiny, it may well be that they felt they were correctly described by Captain Edward Johnson, one of their early chroniclers, when he prophesied, "The Lord Christ intends to achieve greater matters by this little handful than the world is aware of."

A more sober and judicial statement, less in prophecy but greater in history, was made by William Stoughton when he asserted, in his 1638 election sermon, "God sifted a whole nation that he might send choice grain into the wilderness."

The character of the people, their government, their church, their school, all contributed to a great intellectual awakening which was to result in a greater advance and more progress than the human race had ever before accomplished in the same length of time.

A government in which the people chose all of their own magistrates, a church in which each congregation determined its own course, a school dedicated to the service of the political and religious life of the commonwealth, all of these partook of a new experience, a new relationship in the affairs of mankind.

Political and theological discussion went on, liberality grew, the franchise was broadened.

Under the Halfway Covenant the right to vote was to be extended to those who had been baptized and conducted themselves with propriety, even though they were not communicants.

### THE OLD SOUTH CHURCH A MONUMENT TO LIBERAL PRINCIPLE

The Old South Church was created as a monument to this liberal principle. Within its walls many a patriot meeting has been held and many a patriot voice has been raised in defense of the rights of the people.

It was in this meeting-house that the inhabitants unanimously refused to surrender their charter in the days of Andros. Here, in later times, gathered those heroes who were to make the American Revolution.

From the earliest settlement, every court, council, and town meeting was open to every inhabitant, whether he held the franchise or not. He had the right to appear in person, present his cause, and secure a decision.

Local self-government was administered through the town meeting, where the freemen met on terms of equality, a great practical example of democracy.

It was out of all this discussion that there was continued the determination to be free. This determination was strong enough to engage in active preparation for open resistance against the tyranny of Andros when it became apparent that what Charles the Second had done in England he proposed to do in America.

The charter was revoked, self-government ceased, people were imprisoned, congregations were dispossessed, property confiscated, and arbitrary political and ecclesiastical rule was established.

At last a signal fire shone from Beacon Hill, the drums beat, the people rose, Andros was arrested, and a successful

Photograph from Eugene S. Jones

THE BROAD, FERTILE STRETCHES OF THE HOOSAC VALLEY NEAR WILLIAMSTOWN

Williamstown is the seat of Williams College, whose Institute of Politics is one of the most advanced schools of its kind in America, many of the most noted political economists and diplomatists of the world lecturing before its classes.

revolution was accomplished which only the accession of William and Mary brought to an end.

But this lesson the people never forgot and the same discussion went on.

John Wise, pastor at Ipswich, who had suffered imprisonment under Andros, published a book very early in the eighteenth century in which he said: "The end of all good government is to cultivate humanity and promote the happiness of all, and the good of every man in all his rights, his life, liberty, estate, honour, and so forth, without injury or abuse to any."

By 1765 James Otis declared, "Kings were made for the good of the people and not the people for them," harking back to the day of the High Court of Justice, which executed Charles the First, when its president, John Bradshaw, had said, "There is something that is superior to the law, and that is the people of England."

It was no wonder that the regicide judges found comfort and security among the people of Massachusetts.

### MASSACHUSETTS SOUGHT REFUGE FROM TYRANNY IN REBELLION

Such was the preparation for the Revolutionary War, inevitable after the power of France in America had been broken by Wolfe upon the Plains of Abraham—a revolution which had its significance not so much in the establishment of independence as in the yet firmer establishment of the principle of governments "deriving their just powers from the consent of the governed."

What Cambridge and Watertown and Dorchester had insisted upon at the very outset of their settlement, when the Board of Assistants undertook to levy taxes, choose the Governor, and hold office indefinitely, the men of the Revolution were equally alert to preserve when they rose again to insist on representative government.

They had heard from their grandsires of the Court of High Commission, and from their fathers they had heard of Jeffreys and of Andros.

More, too; they knew that this kind of a government had always put forth an ecclesiastical hierarchy. When all these specters began to rise again under George III, Massachusetts had no idea of submission, but sought refuge in rebellion.

They believed in principles, but they were a practical people; they always translated theory into action. This time it was not the watchfire on Beacon Hill, but the lantern in the belfry of the Old North Church that was the signal which brought the men of Massachusetts with arms in their hands to the defense of their liberties.

### THE DECLARATION OF RIGHTS

How far the people of the Commonwealth had advanced between 1620 and the days of the Revolution is indicated by the difference between the *Mayflower* Compact and the Declaration of Rights and the Frame of Government, which is the title of the Constitution adopted in 1780.

The declaration sets out with great precision the fundamental principles of liberty established by law.

Article I declares that all men are born free and equal. Article II guarantees religious freedom. Article X asserts the right of protection of life, liberty, and property by the government, and as a corollary the necessity of serving and supporting the government.

Article XVIII enjoins "a constant adherence to piety, justice, moderation, temperance, industry, and frugality" as necessary to preserve liberty and maintain a free government.

Article XXIX proclaims "the right of every citizen to be tried by judges as free, impartial, and independent as the lot of humanity will admit."

Article XXX decrees a complete separation of the legislative, executive, and judicial departments, "to the end that it may be a government of laws and not of men."

In between is asserted the sovereignty of the people, the liberty of speech and of the press, the right to trial by jury, and the duty of providing education, together with the other guarantees of freedom.

### THE FIRST PUBLIC SCHOOL OPENED IN BOSTON IN 1635

We have come to think of all these principles as natural and self-evident. It is well to remember that we are in the enjoyment of them by reason of age-old effort and the constant sacrifice of treasure and of blood finally wrought into

© Major Hamilton Maxwell

AN AIRPLANE VIEW OF BOSTON, LOOKING OUT TO SEA

The dominating tower is that of the new Customhouse, which had to be run up high in the air because the great volume of business of the port outgrew the amount of real estate owned by the government. The top of the tower is 498 feet above the sidewalk, and stands guard over the city as the Washington Monument does over the Nation's Capital. In the left foreground is the group of new buildings of the Massachusetts Institute of Technology, Cambridge, fronting on the Charles River Basin.

standing law. There is no other process by which they can be maintained.

All of this has been the inevitable outcome of the belief of the Puritans in the rights of the individual.

This required education, and the first public school was opened in Boston in 1635. In 1647 the General Court enjoined each town of fifty householders to have a primary school and each of one hundred families a grammar school. In 1839 a State Normal School was opened, and Massachusetts was the first to have a State Board of Education.

The same ideal that educated the mind protected the health and regulated industrial conditions. In 1836 the first Child Labor Law was passed. In 1842 combinations of workmen made for the purpose of improving their conditions were declared lawful. In 1867 factory inspection was begun.

The year 1869 saw the first Railroad Commission and the beginnings of a State Board of Arbitration. It was here that there was established the first State Board of Health, the first State Board of Charities, the first State Department of Insurance, the first Minimum Wage Law for women and children, and the first State Sanatorium for the treatment of tuberculosis.

Massachusetts has been the location of an enormous industrial development. It is claimed that the first agricultural show was held there. Certainly it was the home of the Baldwin apple and the Concord grape. There the first railroad was built.

### FOUR GREAT INVENTIONS AND THEIR RELATION TO MASSACHUSETTS

Four inventions, most important in modern life, are represented by the telephone which Bell invented there, the telegraph, the sewing-machine, and the cotton gin of Morse, Howe, and Whitney, three of her native sons, while inoculation was first used there by Boylston, and the first practical demonstration of the discovery of ether was made in one of her hospitals.

There is the greatest fish market, leather market, wool market, and the principal center for the production of textile machinery, boots and shoes, cotton, woolen and worsted goods, paper, and all government banknote paper, and the greatest worsted, cordage, and shoe machinery mills in the world.

### GREAT NAMES ON MASSACHUSETTS' ROSTER

Massachusetts has contributed men of great eminence to all the learned professions. Jonathan Edwards preached there, Benjamin Franklin was born there. It has had such scientists as Agassiz and Gray, such preachers as Channing, Parker, Brooks, and Moody.

In literature it carries such names as Emerson, Hawthorne, Holmes, Longfellow, Lowell, Whittier, Everett, Phillips, and Julia Ward Howe; in art, Sargent, Whistler, Stuart, Bullfinch, Copley, and Hunt. Among its lawyers are Story, Cushing, Shaw, Choate, Webster, and Parsons.

Among its statesmen have been the Adamses, Webster, Sumner, Wilson, and Hoar.

It has been the abiding place of strong common sense, illustrated by Samuel Adams, master of the town meeting, and Jonathan Smith, the farmer from Lanesboro, who with Adams swung a hostile convention to the ratification of the Federal Constitution.

Another clergyman, from Ipswich, was Manasseh Cutler, who drafted the Ordinance of 1787, which Representative Dane, of Beverly, presented to Congress, thus dedicating a sufficient area to freedom to insure the ultimate extinction of human slavery.

The Commonwealth has furnished pioneers who have gone everywhere. They are represented by such men as General Rufus Putnam, who planned the settlement of southern Ohio; Marshall Field, the great merchant of Chicago; the five students of Williams College who laid the foundation of American foreign missions at the memorable haystack prayer meeting; Peter Parker, who established the first hospital in China; while in another field of pioneering was Garrison, the abolitionist; Clara Barton, who founded the Red Cross; Mary Lyon, who led the way at Mount Holyoke to higher education of women; Horace Mann, who was foremost in the training of teachers for the public schools.

For more than three hundred years

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YACHT FLEET IN GALA ATTIRE AT MARBLEHEAD, MASSACHUSETTS

American yachts, like the public vessels of the United States, always "dress ship" on the Fourth of July. The gaily colored signal flags fly with kaleidoscopic effect from early in the morning until sunset.

there has gone out an influence from Massachusetts that has touched all shores, influenced all modes of thought, and modified all governments. How broad it has been is disclosed when it is remembered that Garfield and Lincoln came of Massachusetts stock.

From the earliest days the people have exhibited a high capacity both for civil and religious government. In 1630 the first general court ever held on this side of the Atlantic Ocean assembled at Boston. In 1637 the first General Council of Churches was held in Cambridge. In 1641 a code of laws for the Colony, known as the Massachusetts Body of Liberties, was adopted, forbidding bond slavery.

In 1643 the New England Confederation was formed. This was a league and not a federacy, but it distinctly shows the national tendency. In 1646 there was convened a church synod which adopted the Cambridge platform. In accordance with its terms, the Congregational churches of New England were governed for a long time.

All of these were expressions of the fundamental principles of government, not yet in the form of finished product, but sufficiently explicit to rank with the great charters of history.

What an important influence the churches and clergymen were in this early life is apparent wherever we turn. To Robinson, who remained at home, were joined others equally prominent who led their flocks to these shores.

As Hooker, the early clergyman of Cambridge, who, passing on with his congregation to Hartford, set the inextinguishable mark of freedom and local independence under the representative system upon government, so Shepard, who succeeded to his pulpit and was one of the committee of six magistrates and six clergymen chosen to establish the college, set the same inextinguishable mark on education. It was in their town that the first book ever printed in America came from the press.

#### SCENE OF FIRST ARMED CONFLICT OF REVOLUTION

Wherever a town meeting is held, wherever a legislature convenes, wherever a school-house is opened, the moral power of these two men is felt. The Puritan was ever intent upon supporting democracy by learning, and the authority of the state by righteousness.

It was on the soil of Massachusetts that there first met in unmistakable armed conflict the forces of King George and the forces of the colonies at the opening of the Revolutionary War. That day marks Concord and Lexington, soon to be followed by Bunker Hill.

It was under the elm at Cambridge, a few days following, that General Washington formally took command of the first patriot army.

The first company to be enrolled, the first men to shed their blood, and the first to reach Washington in response to the call of Lincoln for an armed force, came from Massachusetts.

One of her regiments went with the first troops to Cuba.

Her military organization went in its entirety with the first National Guard division sent to France, and the first National Guard regiment to be decorated for distinguished service in the field was one of these Massachusetts regiments.

In the works of humanity there has been a like promptness. When flood, fire, earthquake, or other calamity has fallen upon a community, relief and charity have been quick to flow from Massachusetts.

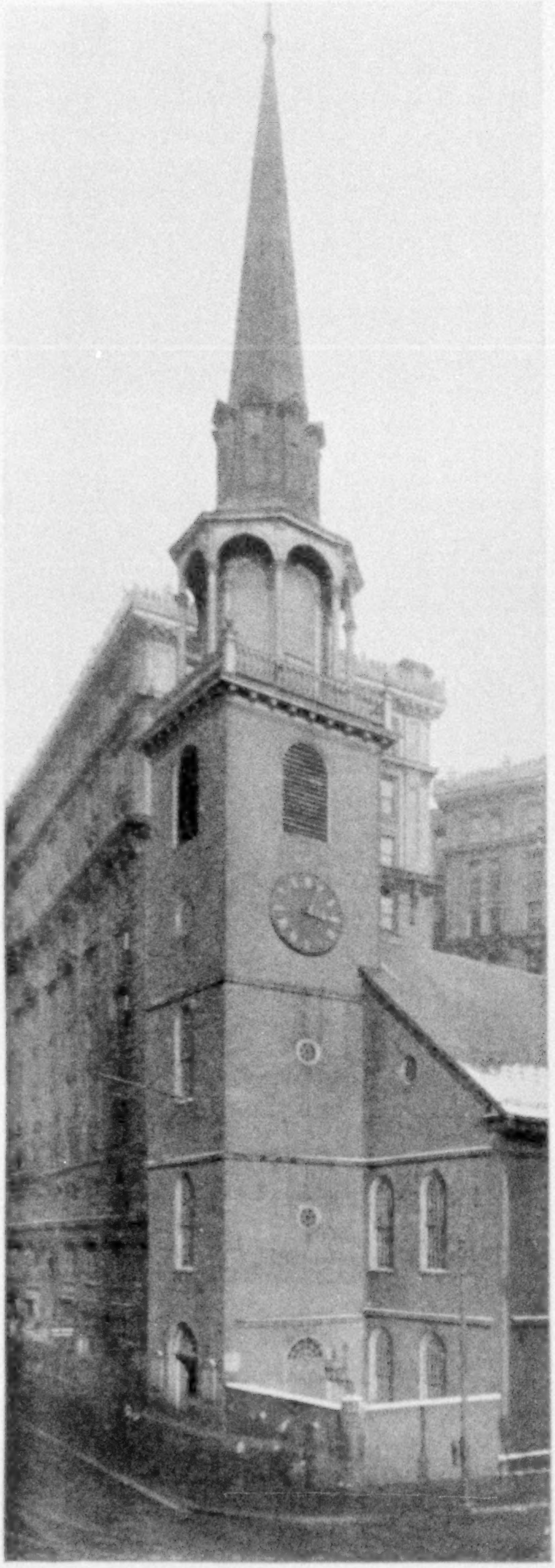
When Halifax was shaken by explosion, before any other relief could respond, the Public Safety Committee of Massachusetts was on the spot with medical skill, hospital supplies, and trained business ability which met the emergency.

#### WELFARE OF PEOPLE ALWAYS FIRST

The contribution which Massachusetts has made has been on the side of practical affairs. It has been a demonstration of the method through which the power of intelligence and wealth are to be dedicated to the public service. Always the end in view has been the welfare of the people.

In this there has been no class distinction. Properly and truly her designation has been "The Commonwealth."

This principle has been applied educationally, industrially, and humanely. It has given not only cultural training, but professional, technical, agricultural, and trade schools; it has used the wealth created in industry not merely to heap up treasure for the few, but to provide safe



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OLD SOUTH CHURCH: BOSTON

"Within its walls many a patriot meeting has been held and many a patriot voice has been raised in defense of the rights of the people" (see text, page 345).

and healthful conditions of employment and reasonable wages, through a Board of Conciliation and Arbitration, for the many.

It has set up a public tribunal guaranteeing to the people the uttermost service that public utilities can render under the compensation which they are to receive.

It has adopted preventive measures and ministered to those suffering from disease of the body or of the mind, restoring the deficient, reforming the criminal.

It has reached out beyond all of these calls at home to minister in the missionary field of all the world. Faith, hope, and charity have been translated into good works.

While there has come to the sons of the Puritans that progress which results from science and great material resources, their supreme choice is still made in favor of a greater power.

FAITH IN CHARACTER

The Supreme Judicial Court of Massachusetts, which enjoys a reputation for sound opinions and which makes its decisions more often cited than those of any other court save the Supreme Court of the United States, recently announced the faith that is dominant still.

"Mere intellectual power," the decision runs, "and scientific achievement without uprightness of character may be more harmful than ignorance. Highly trained intelligence, combined with disregard of fundamental virtues, is a menace."

Above all else, the people still put their faith in character.

They do not suppose that all virtue landed at Plymouth Rock, that all patriotism defended Bunker Hill. From every people and from every faith there have come Puritans. Every town and countryside has bred devoted patriots.

The word of Massachusetts has never been used to utter a narrow and provincial view. Her ideal was correctly voiced by one of her greatest sons, Benjamin Franklin, when he exclaimed, "Above all, Washington has a sense of the oneness of America. Massachusetts and Georgia are as dear to him as Virginia!"

It is because Plymouth Rock, Bunker Hill, John Adams, and Daniel Webster represent the nation that they glorify their State. In that faith Massachusetts still lives.

# AMERICA'S AMAZING RAILWAY TRAFFIC

By William Joseph Showalter

Author of "The Panama Canal," "How the World is Fed," "Industry's Greatest Asset—Steel," "Coal—Ally of American Industry," etc., in the National Geographic Magazine

IN THEIR rôle as arteries of commerce, the railroads of the United States carry the lifeblood of trade to the ends of the nation.

So great is that task that it is difficult to get an adequate picture of it; for the statistics of train-miles, car-miles, passenger-miles, and ton-miles expand into millions and billions so rapidly that only those who combine the industry of the busy bee and the patience of the suffering Job can reduce them to terms within the grasp of laymen.

If all the people of the United States were reviewed in single file, passing at the rate of one a second, forty months would elapse from the day the head of the column marched by to the hour the rear guard approached. Yet the annual transportation task devolving upon the railroads is equivalent to moving all these people, with eight tons of freight for each of them, from Paris, France, to Genoa, Italy.

Stated in another way, if Father Adam, according to Biblical chronology, had started a mixed train running down through the centuries, at a speed of 22 miles per hour, carrying 40 passengers and 346 tons of freight, and if that train had never stopped from then to now, it still would not have covered as great a distance or performed as large a passenger or freight service as the trains of the United States do in a normal year.

## THE LENGTH OF AMERICA'S RAILWAYS

Counting all sidings, yards, and multiple tracks, there are approximately 375,000 miles of rails in the United States. How distant the first mile from the last will the better appear if it be told that the Twentieth Century Limited—the crack New York Central flyer between New York and Chicago, maintaining an average terminal-to-terminal speed of approximately 50 miles per hour—would require from the birth of the New Year to within a fortnight of Thanksgiving to cover this mileage.

It is a far cry from the splendid four-track route, with grades reduced to negligible percentages, and curves all but eliminated, stretching between the major cities of the country, to the neglected single-track line, with grades everywhere and curves more numerous than tangents, stretching between Junctionville and Podunk, the latter characteristic of the railroads of 50 years ago and the former the latest development of the art of railroading.

Some two decades ago the freight traffic of the country had grown so heavy that curves and grades regarded as inconsiderable in the first half century of American railroading became serious obstructions to the free movement of traffic under 20th century conditions.

All over the United States one may today see traces of abandoned rights of way, meandering here and there in a fashion that makes the traveler think that the early engineers must have followed the cows about and plotted their paths, and remind him that tens of thousands of miles of railway had to be rebuilt to meet the nation's demands for better freight and passenger facilities.

## MILLIONS FOR MINUTES

With the abandonment of these early railroads have come the splendid multiple-track highways, without which the present volume of traffic could not be handled.

A typical case of spending millions to save minutes and pennies appears in the history of the Lackawanna. That road was first built half a century ago, primarily as a coal-carrier between Scranton and New York. Money was not plentiful in those days; so many a compromise with grades and curves had to be made.

But a day dawned when the Lackawanna saw that if it were to compete with other companies it must have scores of the grades and curves on its line ironed out. Across New Jersey from Port Morris to Delaware Water Gap was a stretch

© K. D. Ganaway

"THE SPIRIT OF TRANSPORTATION"

Nothing that is material does more to make a nation great than its railroads. The interchange of raw products makes possible big industries; the free movement of commodities from producer to consumer makes available vast markets; opportunities are afforded for the flow of commerce and the intercourse of minds, thus welding the diverse sections of a wide-flung country into one mighty, homogeneous community. Above is a picture of some of the big engines of the Santa Fe in their Chicago station, seemingly endowed with life and impatient to be up and away on their journey to the shores of the Pacific.

of road, 39½ miles long, meandering about and dipping up and down as only old-fashioned roads did.

Nothing less than a cut-off would cure that situation, and so a line only three miles longer than air-line distance was laid out, shortening the route between Scranton and New York 11 miles.

Fills and cuts and tunnels required to carry the road diagonally across deep-valleyed watercourses and high-ridged watersheds made the cut-off one of the most expensive in the history of railway building; but it shortened the schedule of passenger trains by 20 minutes, cut down the running time of freight trains by an hour, and more than doubled the length of the average coal train moving over the Lackawanna; so that even a million dollars a mile spent to shorten the line proved one of the best investments that road ever made.

The same company did another spectacular thing in eliminating grades and curves when it built its famous viaduct across the Tunkhannock Valley. That viaduct is nearly half a mile long, and as high as a 20-story building. The cut-off of which it is a part saves 3.6 miles between Scranton and Binghamton, but even though built at a cost of three and a third million dollars per mile, the Lackawanna made a fine investment in its construction (see illustration, page 363).

### A HIGH-GRADE LOW-GRADE RAILWAY

The Pennsylvania main line between Philadelphia and Pittsburgh strikes the lay traveler as being about the last word in grade and curve reduction; and, so far as passenger trains go, it is. But such a tremendous freight traffic as the Pennsylvania handles eastward called for even better grades than the main line offers. The traffic from the East to the West is so much lighter than that moving from the West to the East that the engineers can concede much to westward grades.

So it was decided to build a low-grade freight line from Pittsburgh to New York. That line now is in operation, except for 23 miles over the Allegheny Mountains, where the grade is 52.8 feet to the mile. Its steepest grade in the path of eastbound traffic is only 17 feet to the mile, up which an engine can pull any train that it is able to start on the level. The Pennsylvania has for some time been studying the question of electrifying this heavy grade over the Allegheny Mountains, which includes the famous "Horseshoe Curve."

### THE LUCIN CUT-OFF

When the Union Pacific was building its line toward the Golden Gate, the Great Salt Lake lay across its path. In those days it did what any other railroad would have done—it made a detour.

That detour became a nightmare to the management several decades later, for it added 44 miles to the journey from Omaha to San Francisco, made every train lift itself an unnecessary 1,500 feet, and forced all trains to follow needless curves equivalent to 10 full circles.

So the Lucin Cut-Off across the Great Salt Lake, costing $10,000,000, was built. It proved a good investment, for the curves, climbs, and distance eliminated saved some two hours of precious time and millions of dollars in operating expenses.

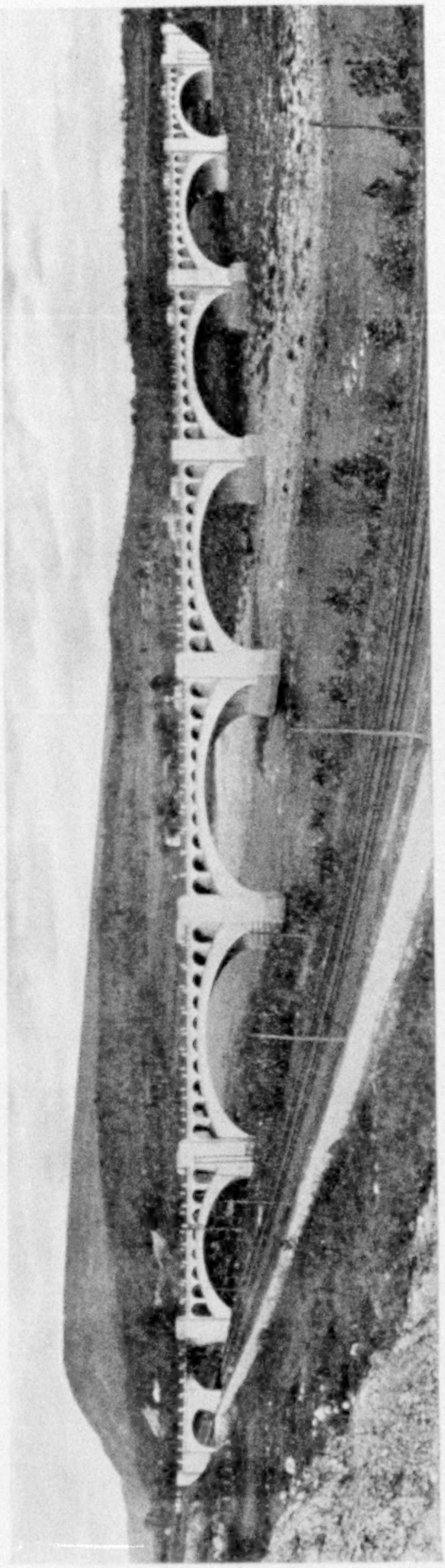
The Canadian Pacific, which gets a little look-in on the United States by crossing the State of Maine, has been one of the roads to modernize its pioneer lines in many places, particularly in the Rockies and the Selkirks. In the region of Kicking Horse River in the Rockies there was a heavy grade more than four miles long, with a rise of 237.6 feet to the mile. It was known as the Big Hill. Getting a train up that hill was a tremendous task, four to six engines being required. But getting it down was an even more arduous undertaking.

Switches were introduced along the line, and those who operated them had strict instructions to listen for a certain whistle signal. It meant that the train giving it had gotten out of control and must be shunted off onto the siding which ran up a grade, thus effecting a stop.

### CANADIAN PACIFIC BUILDS SPIRAL TUNNELS

To overcome these difficulties, the Canadian Pacific decided to build two spiral tunnels, the first of their kind in America.

The first of these "corkscrew" bores is 3,200 feet long under Cathedral Mountain. A train entering from the east turns in



DELAWARE RIVER BRIDGE AT SLATEFORD JUNCTION, PENNSYLVANIA

This is said to be the longest concrete bridge in the world. The track is carried 75 feet above high water and the piers go down to bed-rock, 61 feet below the ground. It forms a part of the Lackawanna cut-off in western New Jersey (see page 355). The east end of the bridge is in New Jersey and the west end in Pennsylvania.

the direction whence it came, and, after emerging, crosses Kicking Horse River. Then it enters the second spiral tunnel, and, after descending an elliptical curve, emerges, headed west again.

The road in this relocation doubles back on itself twice, spirals its way under two mountains, and crosses the river twice in order to avoid the Big Hill. The improvement cost $1,500,000, but two engines do the work of five or six, and a 10-mile speed has become a 25-mile gait.

The Grand Trunk, in order to command its share in the through business from Chicago to the East, had to find a way to eliminate the river difficulty at Detroit. The St. Clair River connecting Lakes Huron and Ontario is here about a half-mile wide. Bridging it was out of the question. Car ferries were too slow. Hence the railway officials decided to tunnel under the river. They ran steam engines through, but this soon proved so unsatisfactory that a substitute had to be found. The B. & O. pioneering in Baltimore showed the feasibility of electricity, and so the St. Clair Tunnel was electrified, with such success that under-river electrified tunnels became a matter of recognized engineering practice.

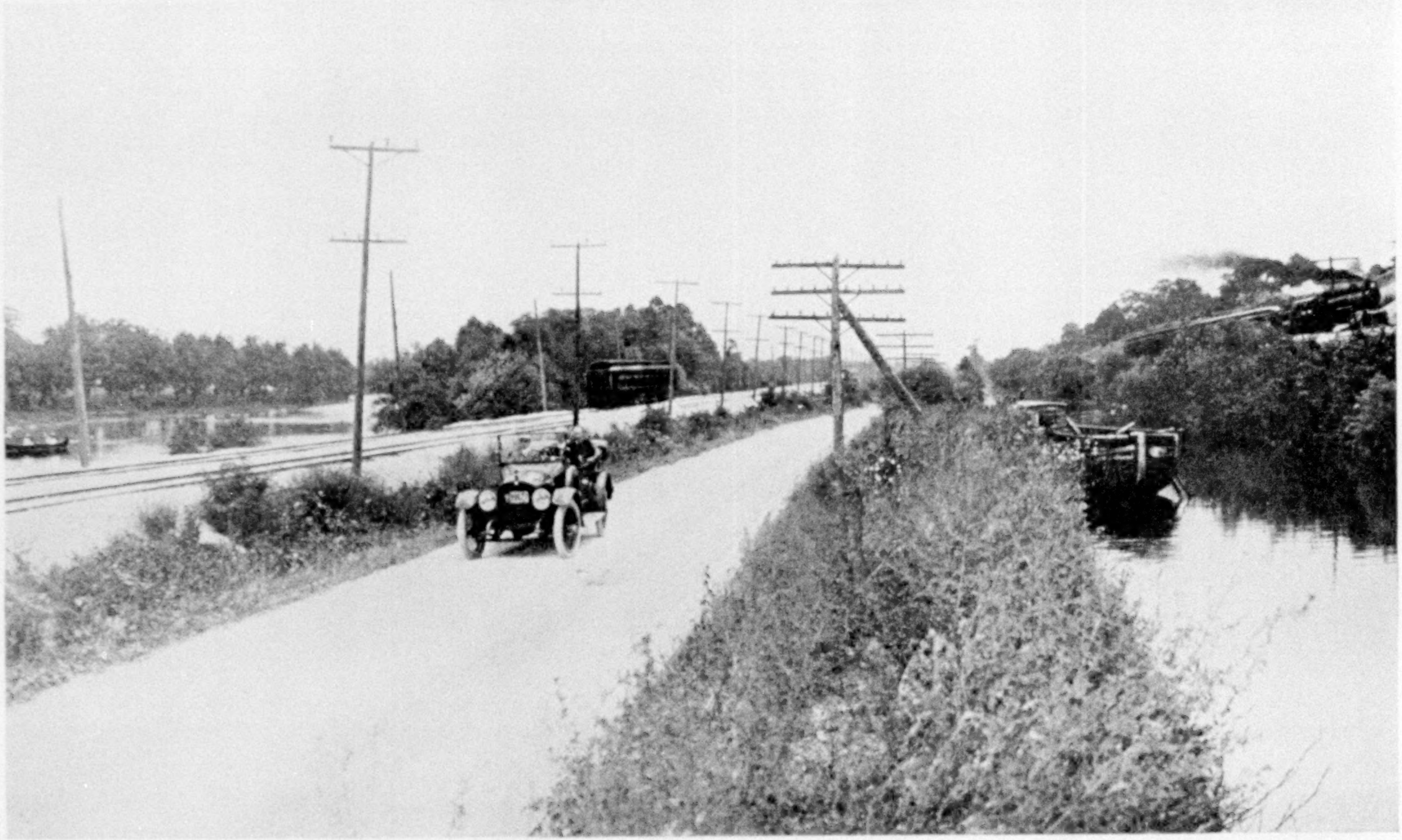
Most roads to-day are old ones transformed by extensions and relocations, but once in a while a new line is built without any of the limitations imposed by former conditions.

Such a railway is the Virginian, extending from Deepwater, West Virginia (near Charleston) to Sewalls Point, Virginia (near Norfolk)—a coal road pure and simple. "I want a road from the West Virginia coal fields to the sea," said H. H. Rogers. "It must be a road on which a modern locomotive can haul 80 fifty-ton carloads of coal from the mines to the seaboard without breaking up the train. The grades eastbound must not exceed 10 feet to the mile."

It was a large order, but one which the engineer daringly executed, the

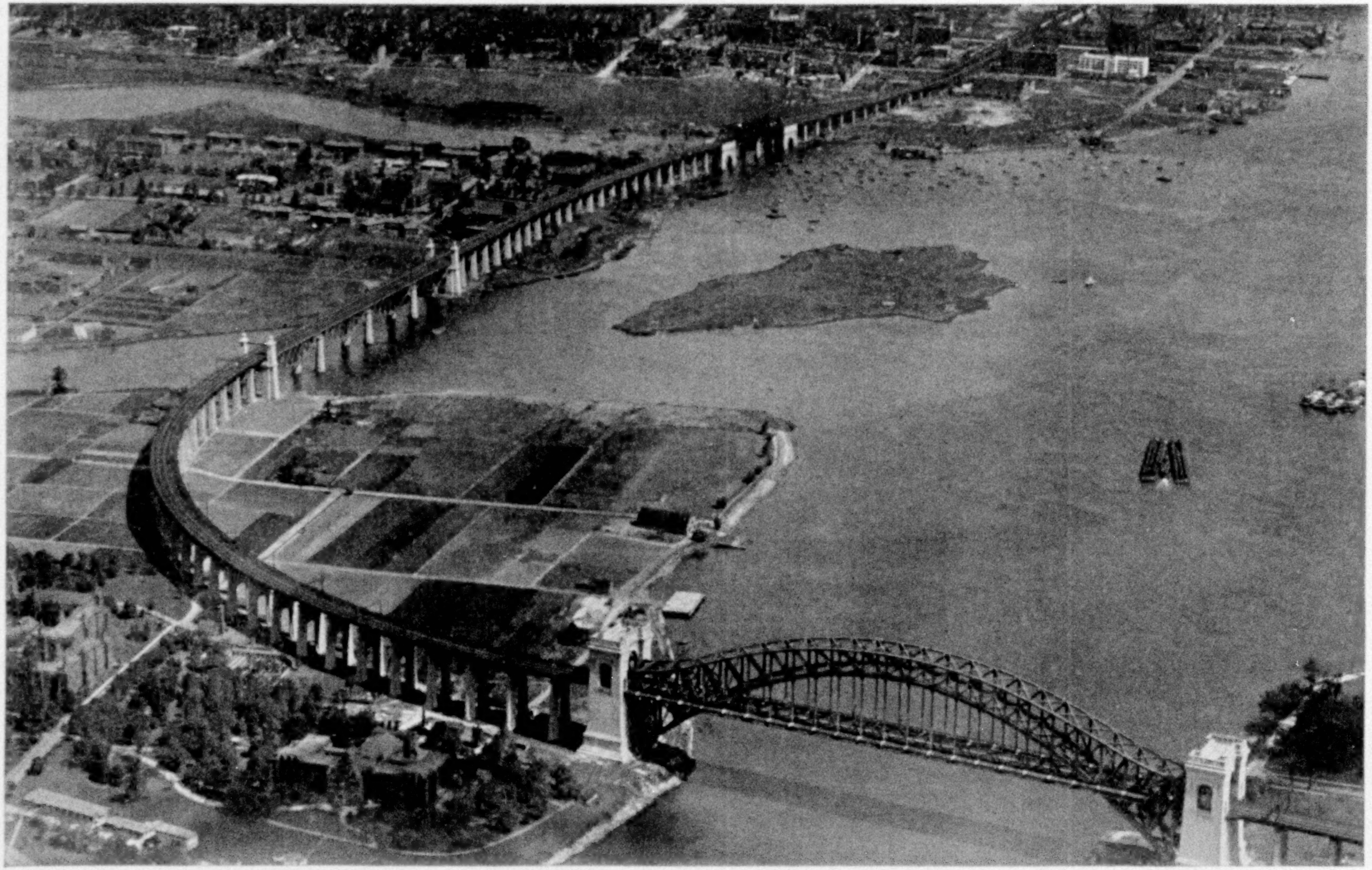
THE LUCIN CUT-OFF ACROSS THE GREAT SALT LAKE

He was a bold engineer who undertook to lay a railroad across Great Salt Lake. Urged on by an imperious executive, the engineer attempted the seemingly impossible. Sink-holes developed and structures that were months in building disappeared beneath the waves of the salt sea. But the faith of the executive never wavered. "We will pass!" was his motto, and to-day the thousands who ride over that cut-off give no thought to the battle staged there between man and Nature (see text, page 355).



FIVE MODERN MEANS OF AMERICAN TRANSPORTATION

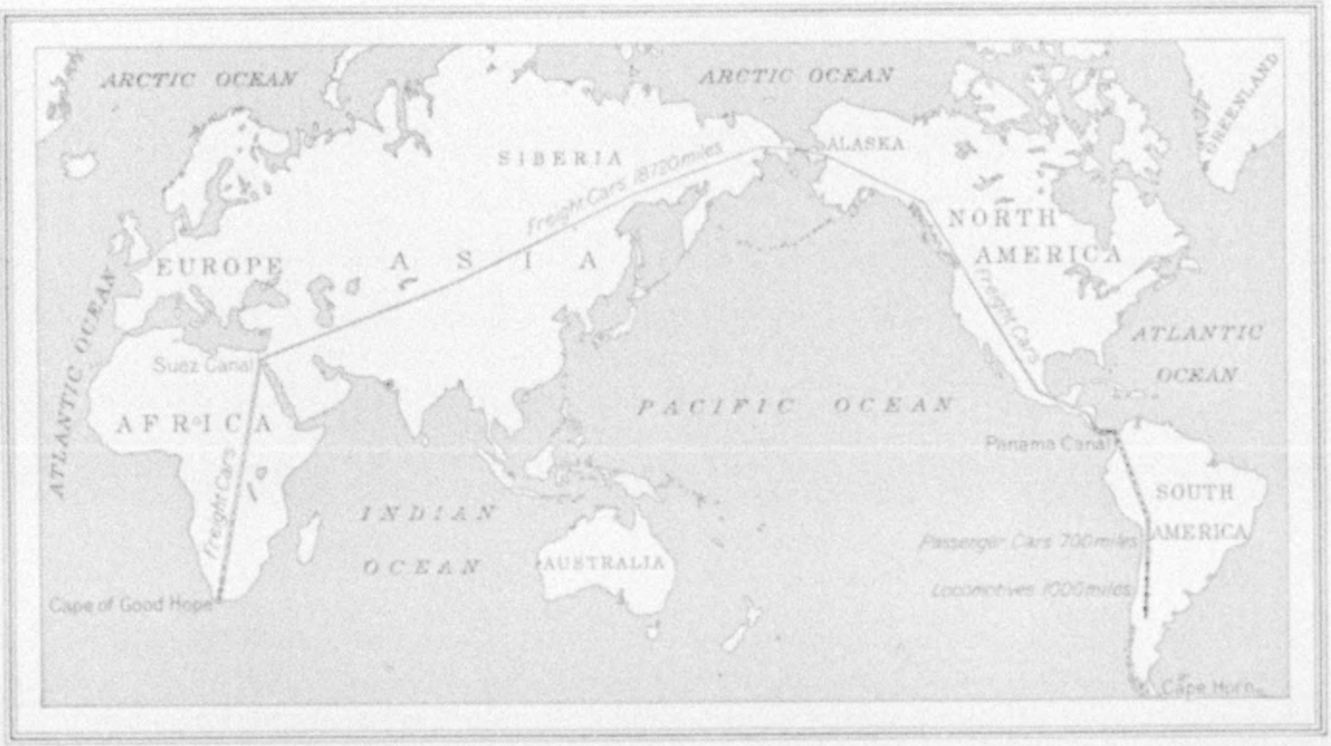
The rivers of the country carry a considerable tonnage; coal moves down the Ohio and the Mississippi from Pittsburgh to New Orleans at a fraction of the rail cost. The electric lines of the country, urban and interurban, carry some ten billion passengers annually. Over the improved highways of the United States, motor cars cover billions of miles. The canals were our first important freight arteries, and as traffic problems increase are expected to come into their own again. The railways, as the years come and go, will probably be forced to relinquish low-class freight to the canals and find themselves kept busy handling high-class commodities.



Photograph by The Army Air Service

HELL GATE BRIDGE, GIVING A THROUGH RAIL CONNECTION BETWEEN NEW ENGLAND AND THE SOUTH

Built in the form of a great crescent, Hell Gate Bridge, spanning East River and making possible the through expresses between Boston and Washington, is one of the world's finest examples of bridge engineering. With the Connecting Railway, of which it is a part, it required four years to build, at a cost of $27,000,000. In the foreground is the 1,000-foot steel span, the largest in the world, containing four times as much steel as the Woolworth Building. In the lower right-hand corner is a bit of Long Island. Beyond the steel span is Ward's Island, and above that Randall's Island. The channel in the background is Harlem River, and beyond that the southern edge of the Bronx (see inset Map of New York in the Map of the United States supplement with this issue of THE GEOGRAPHIC).




Drawn by A. H. Bumstead

A GRAPHIC REPRESENTATION OF THE VASTNESS OF THE ROLLING STOCK EQUIPMENT OF AMERICA'S RAILROADS

If all the freight-service cars, all of the passenger-service cars, and all of the locomotives in the United States were coupled together, they would make a train reaching from the Cape of Good Hope, via the Isthmus of Suez, Bering Strait, and the Panama Canal, nearly to Cape Horn (see text below).

only exception being a stretch of 11 miles, where the eastbound grade is over a 100 feet to the mile.

But here the largest locomotives in the world act as pushers and raise the 80-car train intact over the crest of the line. A whole new coal territory has been tapped, and if the Virginian Railway hauls 10,000,000 tons of the mined product to market annually it can operate for 400 years before exhausting its freight supply.

A VAST NUMBER OF ENGINES AND CARS

When one comes to the rolling stock of all the railroads of the United States, consisting as it does of 2,348,000 freight cars, 65,000 locomotives, and 53,000 passenger-train cars, and attempts to visualize its immensity, perhaps the best picture to be obtained will come from imagining all these engines and cars coupled into one train.

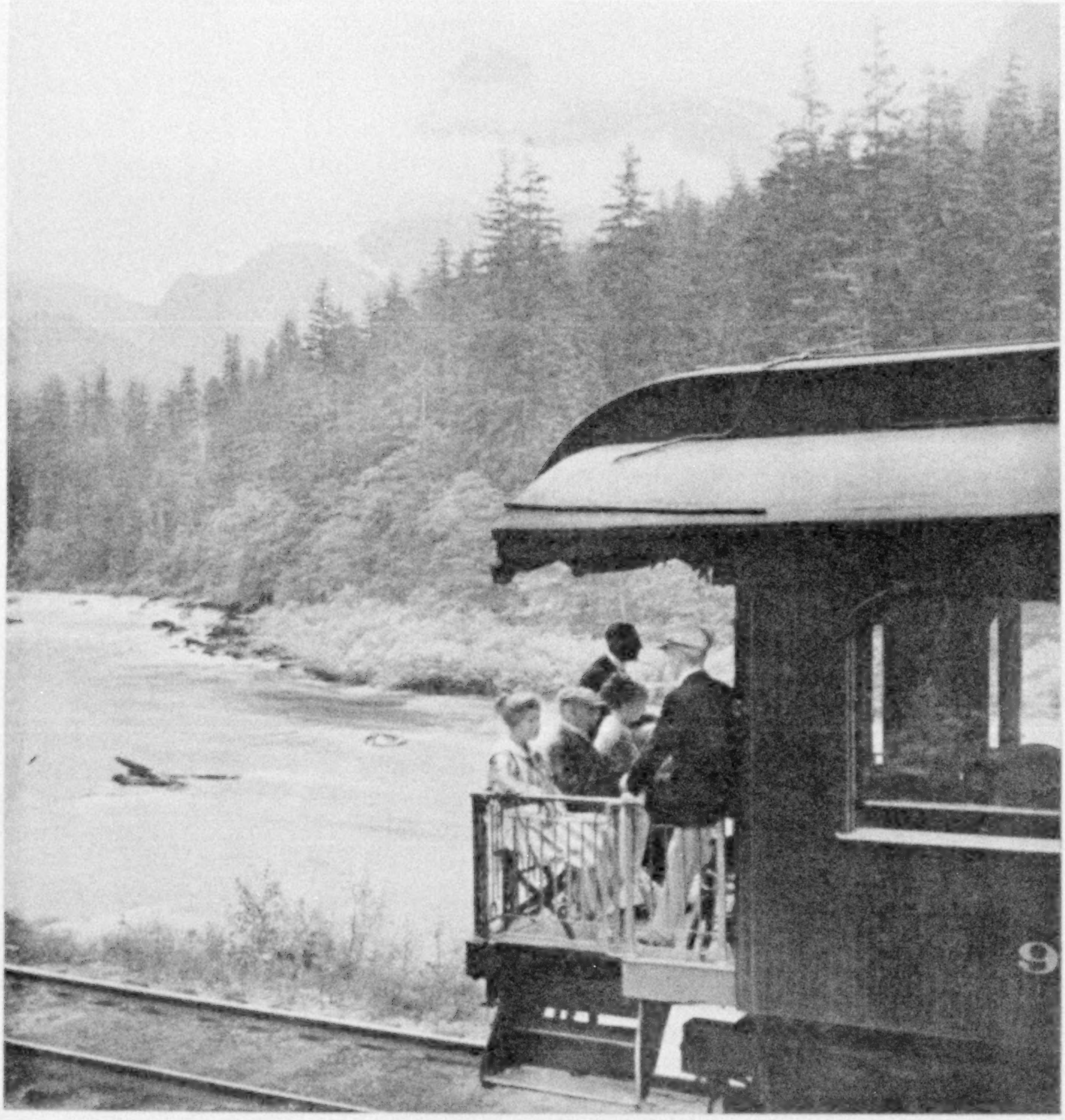
Suppose this train to be on a sort of vast horseshoe curve, sweeping through Africa, Asia, North America, and South America via the Suez Canal, Siberia, Alaska, and Panama (see map above).

So long will the train be that when the last caboose is at the Cape of Good Hope the forward engine will be only 1,200 miles out of Cape Horn.

The conductor on the rear platform might listen to the break of the waves on the South African coast while the brakeman on the forward freight car gave ear to the ripple of the waves on the shore of Lake Titicaca, Peru.

The passenger-train cars would add enough length to the train to make it reach 100 miles beyond Antofagasta, Chile, and the engines would still further extend the train's length, so that it would reach nearly to Valdivia, Chile—a train, indeed, stretching from 30 degrees south latitude in Africa to the Arctic Circle in Asia, and back to 40 degrees south latitude in South America!

What a vast series of contrasts among the thousand miles of locomotives in service on the railroads of the United States! Here is one that made its appearance in the days of brass bands around the boiler, red stripes and stars around the smokestack, and a name on the cab. Here is the old 999, that once hauled the Empire State Express on its road to fame, and later took the prosaic job of hauling light freights on a branch line. Down the



Photograph by Kiser

PASSENGERS ABOARD THE GREAT NORTHERN'S FAMOUS ORIENTAL LIMITED ENJOYING THE SCENERY IN THE SKYKOMISH COUNTRY, WASHINGTON

track is a big Mallet articulated engine weighing 449 tons, having a length of 105 feet, and possessing cylinders of a diameter equal to that of the boilers of many locomotives built since the Civil War.

A FREIGHT LOCOMOTIVE'S STORY

The work of an average freight locomotive is no light chore. Its job is to haul a 1,300-ton train 56½ miles each day, a traffic task equivalent to moving 20 tons from the Statue of Liberty to the Golden Gate.

Hauling such a train, rain or shine, in warm weather or in cold, over heavy grades and around sharp curves, takes a heavy toll out of the freight engine's frame, with the result that for a full quarter of its time it is on the operating table in the engine hospital, or waiting its turn to go there.

When the big mogul's performance is measured by the energy it is able to extract from a pound of coal, it looks like a sheer waster of fuel, for only about one-twentieth of that energy is transformed into drawbar pull. But when one remembers that, for all its limitations, the aver-

© Ewing Galloway

THE RAILROAD BRIDGE ABOVE THE NIAGARA RAPIDS

Once this bridge was regarded as a wonder. To-day it is being proposed to bridge the Hudson with a huge suspension structure the cables of which will be 60 inches in diameter as compared with the 15-inch cables of the Brooklyn Bridge. The main span will be three times as long as that of Hell Gate Bridge (see page 359) and its total length more than a mile and a half. Another huge terminal station, to accommodate those roads which do not enter either of the two existing New York terminals, is a part of the tentative project.

age freight engine is able to move 10 tons of train a full mile for each cent's worth of coal burned, its record does not seem a bad one.

### THE ELECTRIC ENGINE'S DEFI

The electric locomotive, of which there are several hundred in operation in the United States, could tell a startling story.

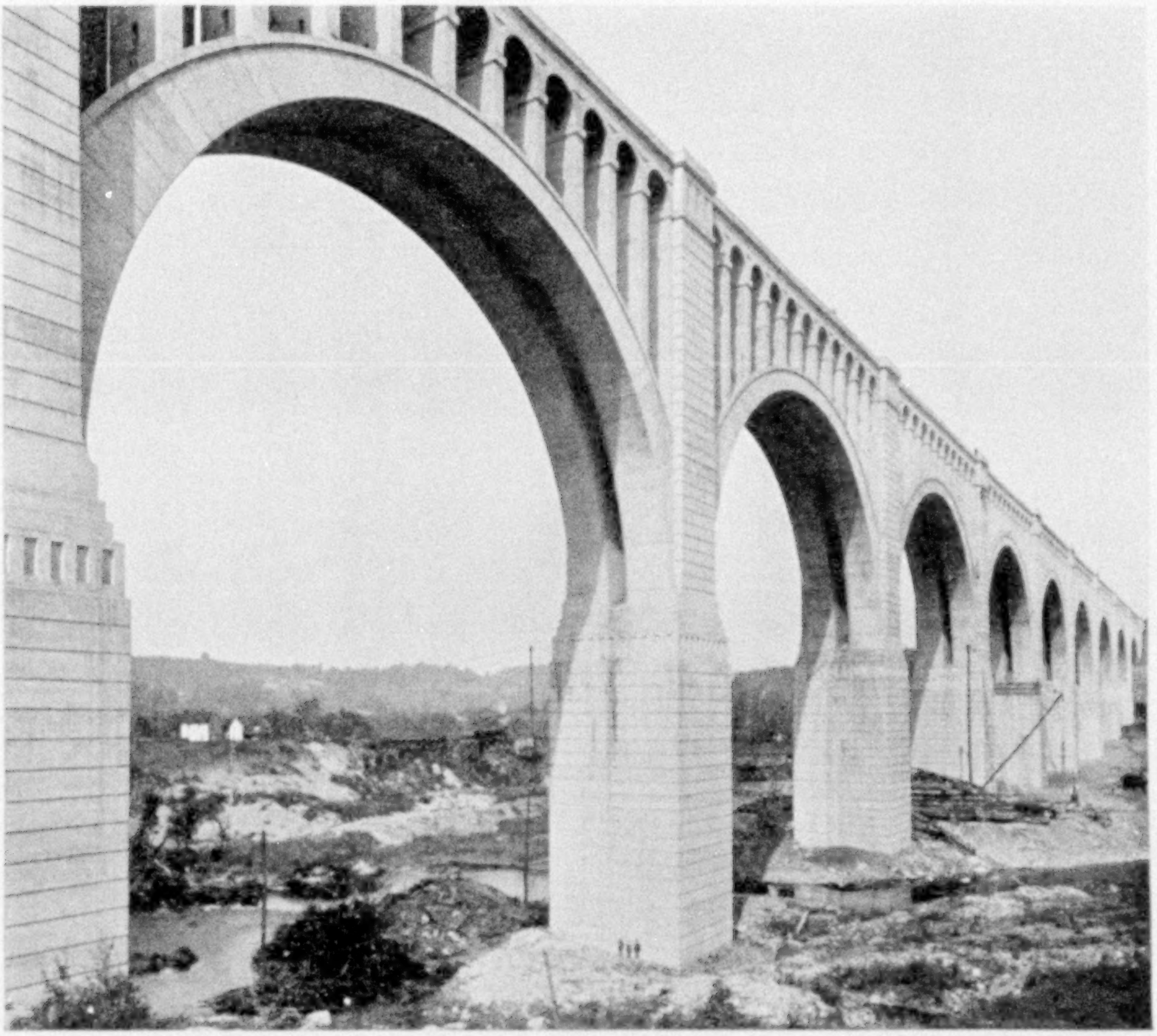
It was born of necessity. When the B. & O. wanted to burrow under Baltimore, coal-burning locomotives seemed out of the question for a tunnel so long. So an electric substitute was created. It showed such good results that one railroad after another tried electrified tunnels, uniformly with success.

Finally the Pennsylvania and the New York Central decided that the electric's past performances had been good enough to justify their building vast terminals in New York City into which no steam locomotive could be admitted. The electric engine's cleanness made possible under-the-river tunnels in the case of the Pennsylvania, and a two-level track-layout in the case of the New York Central.

Electrifying the terminals led to electrified approaches, and wherever electricity got a chance to compete with steam, the former never lost the argument. The electrically propelled train could show the steam train its green flags at the rear any day, and its red lights any night. The electric engine was able to get a 1,000-ton train started from a standstill more quickly than the steam locomotive, at every trial of their relative power.

In the matter of cleanness and economy of operation, also, every test showed in electricity's favor. So the Pennsylvania, New York Central, and the New Haven began to electrify their suburban lines.

Seeing the striking results of electrification around New York, the Chicago, Milwaukee & St. Paul Railway Co. decided to give the electric engine a tryout on a long stretch of its transcontinental



THE VIADUCT ACROSS THE TUNKHANNOCK, IN PENNSYLVANIA

The apparent slenderness of the piers of this bridge is due to their great height. The men standing under the foreground arch give some idea of the viaduct's vast proportions (see text, page 355).

line. It first electrified a division extending from Harlowton, Montana, to Avery, Idaho (near St. Maries), a distance of 440 miles. This section of the C., M. & St. P. crosses the three ridges constituting the Rocky Mountains, and at one place climbs to 6,300 feet.

When put to work hauling trains over that section, the electric locomotives began to show their real mettle. Terminal performances, commuter-zone competitions, and tunnel electrifications are all well enough, but when one comes down to essentials, a long stretch of road with three mountains to cross, innumerable grades to negotiate, and all kinds of weather to face—there is the place to put a locomotive to the real test.

Their performance astonished even electricity's chief supporters. The railroad company found it could operate its trains much more efficiently with 42 electrics than with 112 steam-engines. With the former type it was able to increase the length of each train by a fifth, thereby reducing the number of trains required. Likewise, the running time was cut down by a fifth. The electrics, in fact, demonstrated that they could increase the capacity of a single-track railroad to a point approaching double-track capacity under steam operation.

Many a time a train hauled by a "double header" of steam locomotives rolled up to the electrified division two hours late, after a bitter struggle with the ele-

Photograph from Garnett King

PIERCING THE ROCKS

The Rocky Mountains and the Sierra Nevada are formidable barriers to a great commerce; but with tunnel and bridge, trestle and cut, mountains have been removed, and the citrus fruits of California and the fine timbers of Oregon and Washington are exchanged across these erstwhile isolating barriers for a thousand products of the East.

ments. Radiation from their boilers weakened them, and snow slowed down their pace.

But the electrics are never happier than when there is zero weather around, and they made up all the time the steam-engines lost.

REGENERATIVE BRAKES AT WORK

Not only did the big motors demonstrate their power to pull trains up 2 per cent grades that would break a steam locomotive's heart, and at a speed that even three of the latter could not maintain, but when they got to the top of the mountain they taught a new lesson — superior efficiency in climbing down again.

Being equipped with what are known as "regenerative" brakes, the electric's motor, by the throwing of a switch, is transformed into a dynamo, and the surplus momentum of the train rolling down the mountain is expended in driving this dynamo and sending the electricity thus generated back into the transmission line.

The problem of getting a steam-drawn train down from the crest of the Rockies was frequently as serious as that of dragging it up. The air-brakes frequently were hard to manage, the wheels often got red hot, the shoes sometimes melted.

But with "regenerative" braking, things have changed. All the momentum the brakes had to absorb and waste goes back into the transmission line, to be used as power to pull some other train up the mountain.

When a steam locomotive has its fires banked in the roundhouse it burns 200 pounds of coal an hour; when getting up steam it requires 800 pounds; when standing on side track or at stations it burns 500 pounds, and when coasting downhill 1,000 pounds.

In none of these situations do electrics require any power at all. Coasting down the mountain side, they can pay back from a fourth to a half as much as they borrowed to climb the mountain.

Without a jerk, without noise, without smoke, and without a cinder, they take

their trains up the mountains and down again, at 20 miles an hour on even so heavy a grade as a rise of 105 feet to the mile, and at 60 miles on the straightaway level.

Photograph from Garnett King

BRIDGING A CANYON IN ARIZONA

THE LONGEST ELECTRIC ROAD IN THE WORLD

So gratifying was the electrification of the Harlowton-Avery branch to the Chicago, Milwaukee & St. Paul authorities that they decided to electrify the line from Seattle to Othello. This leaves only a 200-mile stretch to be electrified between the eastern approach to the Rockies and the Pacific Ocean, and gives the United States the longest electrified railroad in the world.

But the test of which the electric locomotive may be proudest took place not so long ago at Erie, Pennsylvania. One of them, just out of the shops on the St. Paul's new order, was pitted against two of the steam giants of the New York Central. They could not be matched in a tug of war, for, pulling against one another, a drawbar would be sure to pull out, with perhaps dangerous results.

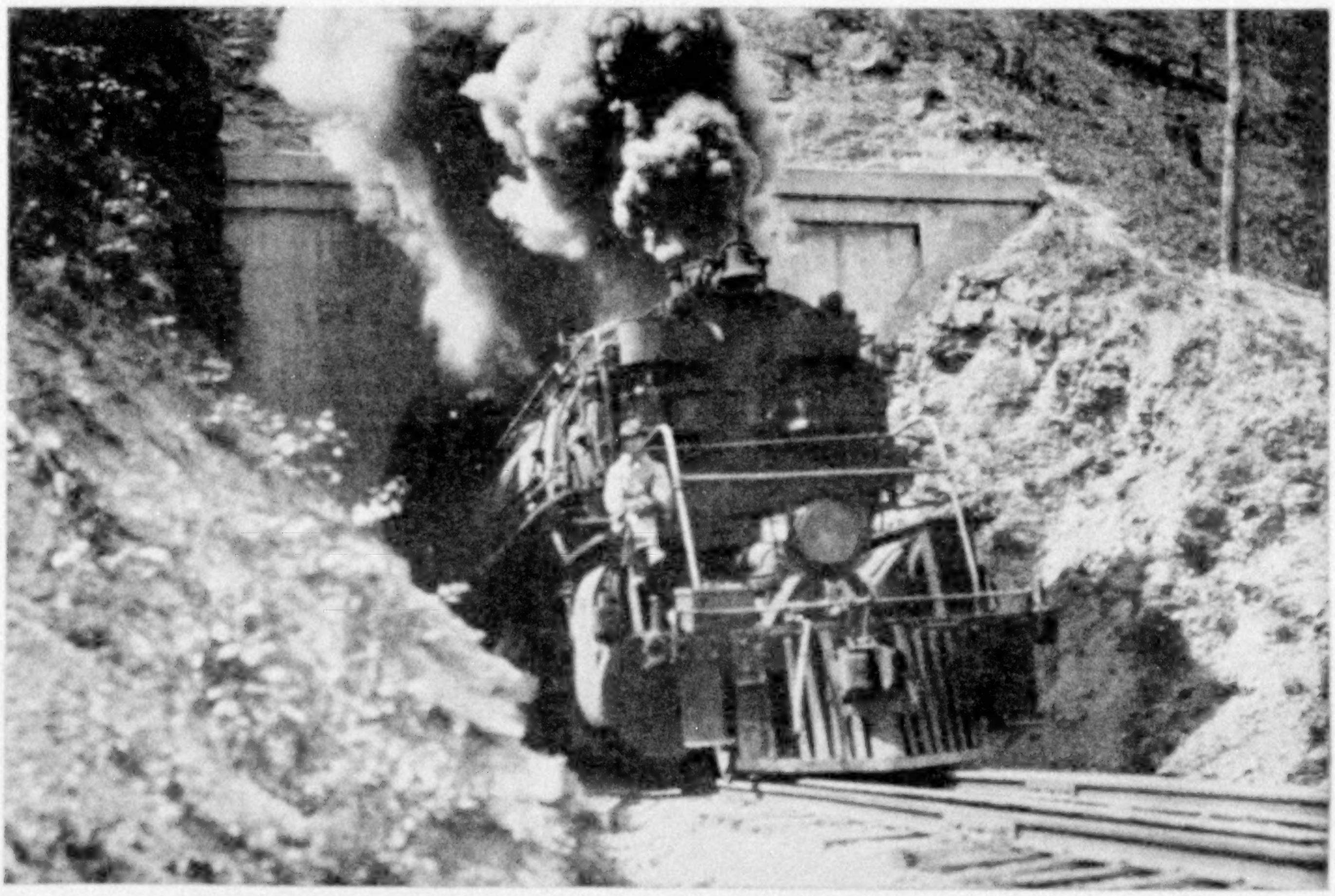
So a pushing contest was staged instead. The two big steam locomotives were coupled together, and thus entered the fray. On a long stretch of track their engineers were told to open the throttles wide. With current off, the electric rival was no obstacle in their path, and they were soon taking it down the track at a passenger-train pace.

Then something happened; the engineer in the electric slowly turned on the current. The speed of the big locomotives began to slacken, and their smokestacks started to spout black smoke in a way that told how hard they were laboring.

Slower and slower they moved; harder and harder they worked, as though they were dragging a tremendous train up a heart-breaking grade; but with all that they could do they continued to lose speed.

Finally, though their throttles were still wide open and their cylinders were hissing with the pent-up steam that was unable to drive the big moguls forward, they were forced to a dead standstill.

But the pause was only for an instant. Still pushing with the last ounce of energy within them, their grip on the rails gave way and they bowed to their master—the electric locomotive. The latter not only



ONE OF THE LOCOMOTIVES OF THE VIRGINIAN RAILWAY (SEE TEXT, PAGE 356)

The "largest locomotive in the world" never maintains its prestige long. Nearly every year sees a larger one built. The Virginian's latest compound articulated Mallets, with their twenty drivers, 449 tons weight, and 147,200 pounds tractive effort, are now the giants of the rails. They can comfortably handle seventy-five 120-ton cars from the mines to the seashore, with the help of a pusher up the mountain grade, and have done much better than that in demonstration tests. On the heavy grades they burn coal at a rate of six tons an hour.

had stalled them, but, turning on them, was driving them back in full retreat, in spite of the fact that they continued to strain every rod in their effort to check their onrushing rival (see page 371).

But, even with that sturdy proof of its supremacy, the electric was not content. Again it allowed itself to be pushed down the track by its two big contestants. Again, with wide-open throttles they rushed it along at high speed. But again a little switch on the electric engine was thrown, a little switch which converted the motor that had overpowered its antagonists into a dynamo that acted as a brake.

Again the big giants began to labor, to shiver at the load they were encountering, to slow down under the burden. Slower and slower they moved, harder and harder they labored, but in vain! For, whether plunging forward, motor-driven, or holding back, regenerative-braked, the electric showed itself their master and proved itself the Samson of rail transportation.

The argument was over, and since that day railroad men everywhere have realized that the electric locomotive is destined eventually to succeed the steam locomotive wherever traffic is heavy and trains frequent.

Already roads are planning in that direction. The Pennsylvania, the Virginian, and many other lines are reckoning with electrification of busier divisions as an end to be aimed at.

## WHAT UNIVERSAL ELECTRIFICATION WOULD SAVE

How much the electrification of the railroads of the country will save is strikingly shown by an investigation based on the St. Paul's experience and other data. This shows that electricity can be produced at 2½ pounds of coal per kilowatt hour, and that 53,000,000 tons would suffice to produce all the electricity re-

A SECTION OF A 16,000-TON COAL TRAIN HAULED OVER THE VIRGINIAN RAILWAY

When the Virginian Railway was built, it was planned to run trains of eighty 50-ton cars from the mines to deep water. In 1909 traffic demands called for eighty-five 50-ton cars. In 1914 it was found necessary to add another five cars to the train. Later it was decided to build 120-ton cars, which would make it possible for a single-track line to do what a double-track line could do with the lighter equipment. Brakes were devised and engines built, making possible the handling of a 16,000-ton train over the line with one locomotive, except in the mountains, where a pusher is added. Such a train was handled in 1921, and this picture shows, at the extreme left, some of the 100 loaded cars used in the demonstration. After passing the Blue Ridge, 10 additional cars were added, making a 17,500-ton train, the heaviest ever hauled in the history of railroading.

quired to move the freight of the United States—a saving of more than 100,000,000 tons a year.

These figures do not deduct anything for the added saving made possible by the use of hydroelectric power—the white coal of the country's unharnessed rivers. They are based on all power being produced by coal-driven dynamos.

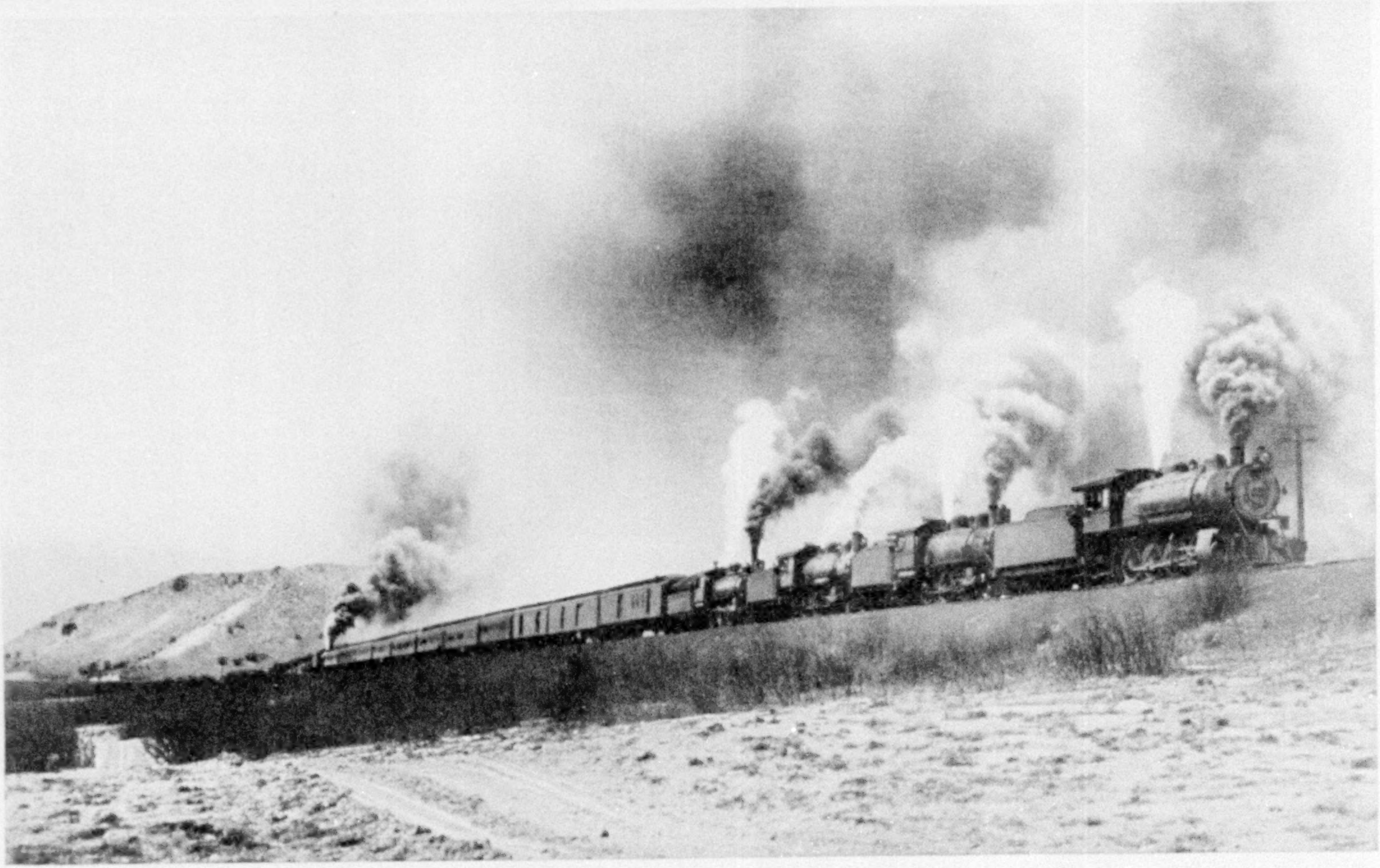
Think of five big carloads of coal being wasted every single minute of the year; of five Niagaras running unharnessed to the sea! There you have a measure of what the electric locomotive promises to save, once it supplants the steam locomotive as the source of rail transportation's power.

With all their lines electrified there would be no reason for the railroads hauling a ton of coal for themselves. There are hundreds of power sites that could be developed, which would greatly reduce the coal tonnage required to drive the dynamos necessary to generate sufficient current to move all the trains of the country.

The power remaining to be supplied by coal could be generated at the mouth of the mine and sent out over wires.

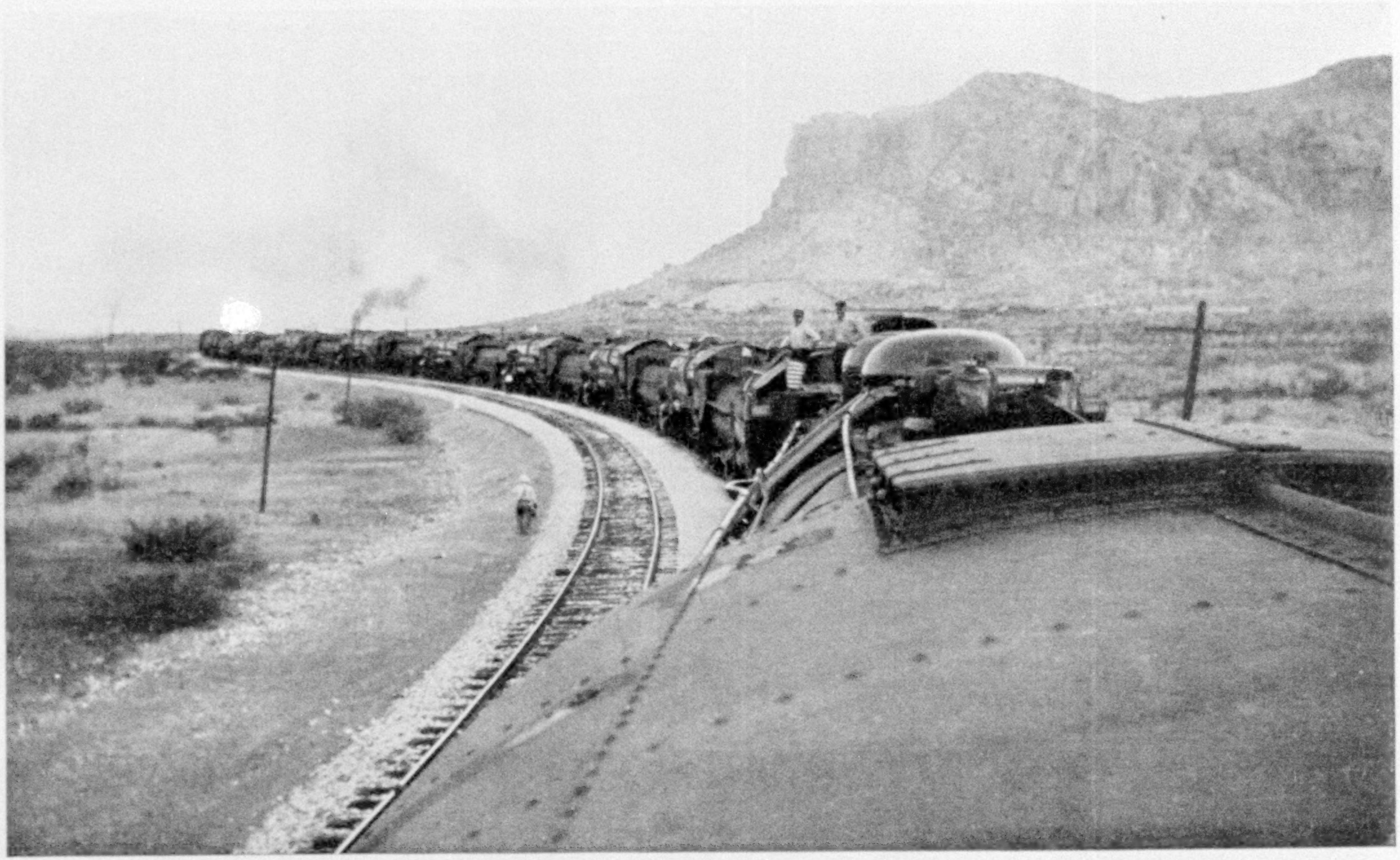
To be relieved of the transportation of approximately 150,000,000 tons of coal a year would mean the saving of more than 3,000,000 carloads of freight, or 60,000 trainloads of 50 cars each. In other words, the coal trains required to haul the fuel used by the railroads themselves to-day would fill eight tracks reaching from Sandy Hook to Golden Gate, and all of this tremendous train movement would be saved by electrification of all lines.

The saving effected if electrification



CLIMBING THE ROCKY MOUNTAINS

The Denver and Rio Grande Railroad crosses the Rockies over three passes, each more than 10,000 feet high. At Ibex Station it reaches 11,522 feet. This is half a mile higher than the highest automobile road in Europe and nearly two-thirds of a mile higher than the Hospice of St. Bernard, the highest habitation in Europe. Five engines are required to move the "Denver Limited" up the Soldiers Summit grade, and even they have a hard struggle when the tracks are wet or greasy.



THE PROSPERITY SPECIAL AT STEIN'S PASS, NEW MEXICO

Last summer the Baldwin Locomotive Works delivered to the Southern Pacific a large order of massive locomotives. Taken as a special, no other train that ever crossed the continent attracted as much attention as this.

© Elmendorf from Galloway

GREAT HARBOR: BUFFALO, NEW YORK

In the foreground are the huge Hulett unloaders, which pick tons of ore from the holds of the Great Lakes ore steamers as a chicken picks grains of corn off the ground. The channel at the left is the western end of the New York Barge Canal.

were adopted only on the Atlantic seaboard from Boston to Washington is strikingly shown in a report prepared, at the instance of former Secretary of the Interior, Franklin K. Lane, by the United States Geological Survey, under the direction of Dr. George Otis Smith.

This report, entitled "A Superpower System for the Region between Boston and Washington," shows that in 1930 the territory in question, for its municipal, industrial, private, and railroad purposes, will require 31 billion kilowatt hours of power, which could be furnished under a coördinated power system at a saving of $239,000,000 per annum.

In the case of the railroads, 19,000 out of 36,000 miles of track could be profitably electrified, at an annual saving in operating costs of $81,000,000, on a capital investment of $570,000,000.

To-day the average steam locomotive works eight hours a day, while the average electric is ready for twenty hours a day service.

It is estimated that there will be a doubling of traffic in this zone by 1930, and that the cost of electrification would be less than the cost of added facilities necessary in adhering to steam power.

One of the secrets of the electric engine's efficiency as compared with the steam locomotive is the greater adhesion of its drivers to the rails. Indeed, it can run twice as fast at maximum adhesion as the steam locomotive.

Some roads are beginning to use motor buses with marked success for the transportation of passengers on lines where the traffic is light. The Pennsylvania's western lines, feeling the pinch of competition from interurban electric lines and highway bus lines, are turning to motorized train service in order to reduce the

THE STEAM LOCOMOTIVE'S LAST STAND

This picture, taken late in the evening, shows two big steam locomotives being driven helplessly down track by one gearless electric engine (see text, page 365).

cost of operation to a point in keeping with the revenues derived.

THE FREIGHT CAR'S SHARE IN THE WORLD'S WORK

When one sees a string of freight cars, some of them for carrying live stock, others for moving products needing refrigeration or ventilation, still others for hauling such diverse products as coal and oil, bulk molasses and ore, it is probably with little realization of the stories they might tell.

If their several stories were made into one composite tale, we would learn that the average car in a recent year ran about 22 miles a day, carried 27.8 tons of freight per load, and secured about 17 loads during the year. One-third of the 9,200 miles it traveled was as an empty.

One does not have to study transportation problems long to find out what a valued public servant the little-appreciated and unpretentious freight car actually is. There is one of them for every eight families in the country, and to them agricultural and industrial America owes a tremendous debt.

What would bonanza crops be worth if there were no freight cars to carry them to the markets of the nation and to start them to the hungry mouths of the world?

How could great factories thrive without the raw materials and the fuel the freight car brings to them, or without the many markets to which it gives them access?

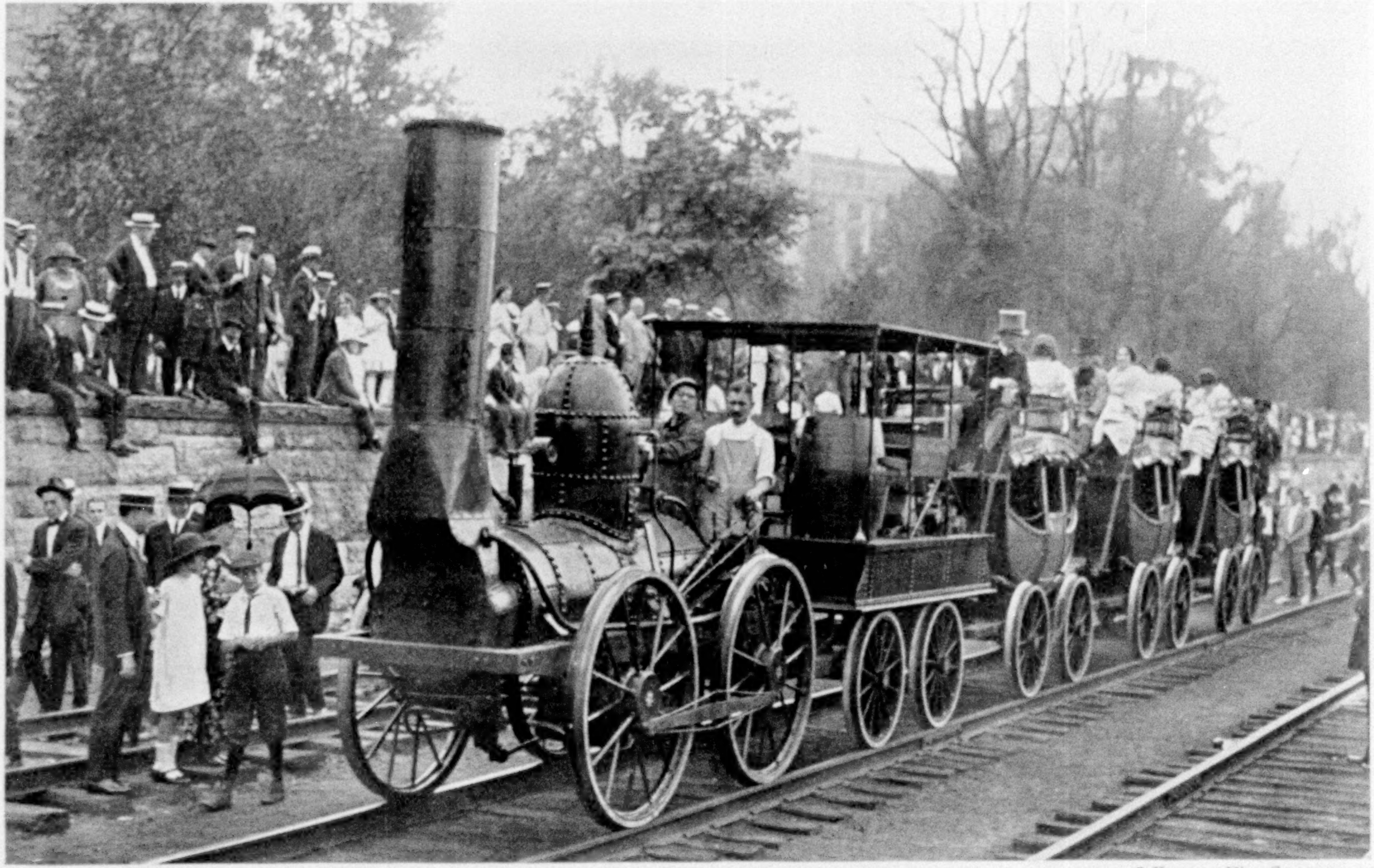
"You never miss the water till the well runs dry" might be paraphrased into "You never appreciate the freight car till there's a car shortage." Indeed, the freight cars are the red corpuscles of the body politic, through which the oxygen of industry and the nutriment of commerce reach the cells that constitute our national life.

In order to obviate the building of large numbers of new freight cars, a national campaign has been started to increase their average daily mileage, to add to their average load, and to cut down the number of days they are out of service awaiting and undergoing repairs.

The railroad executives responsible for the campaign want to speed up the cars, so that they will average 30 miles a day

AN ELECTRIFIED ROAD IN THE CASCADES

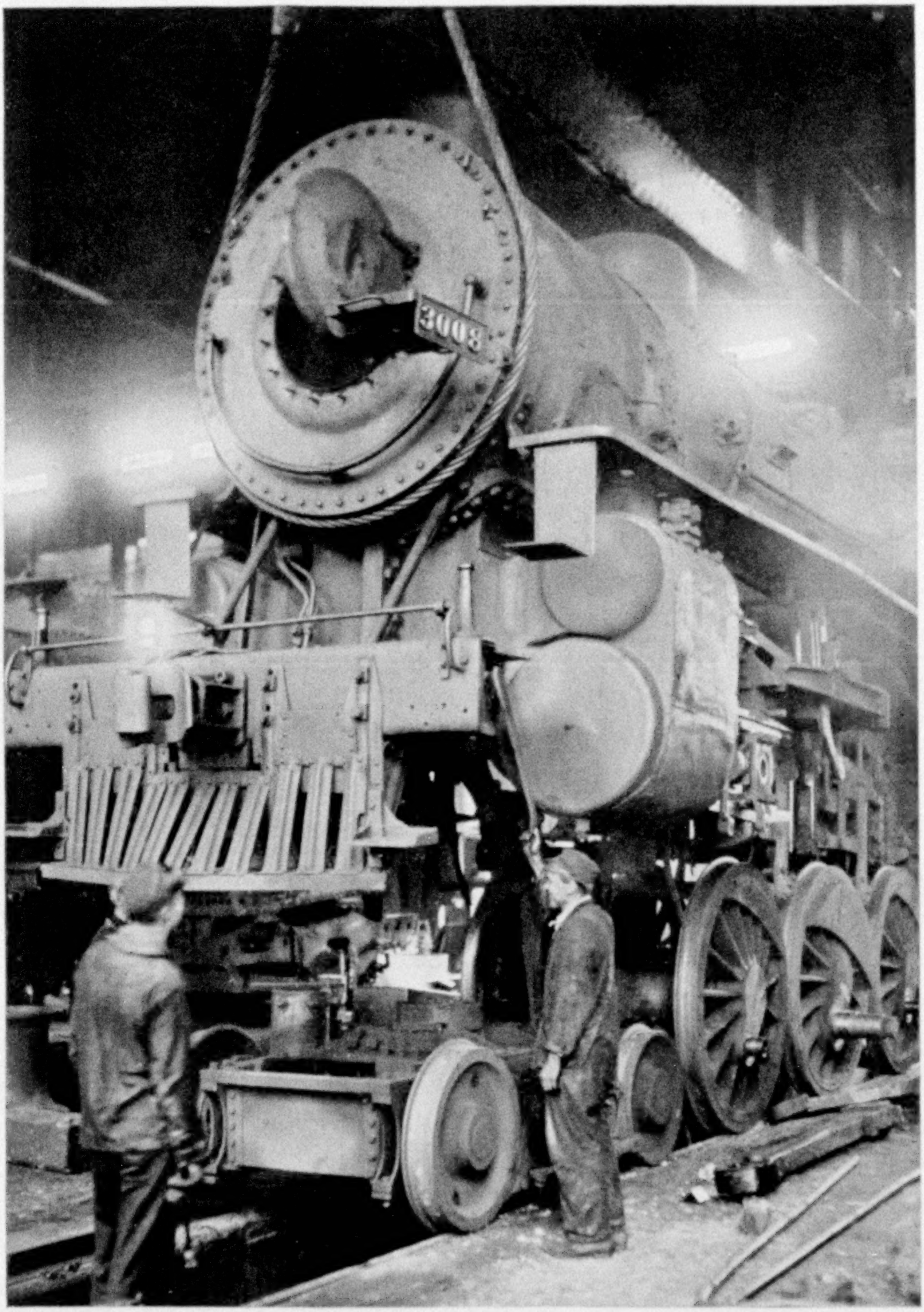
With its Cascade and Rocky Mountain divisions electrified, the Chicago, Milwaukee and St. Paul Railway has taught America how to conserve its fuel supplies. Rivers running down the mountains pull heavy trains up, and a trip by rail without coal-gas and cinders, and minus jerks and jars, becomes a delightful excursion amid some of the world's most majestic landscapes. The overhead wire type of transmission (shown above) is used on the Milwaukee, the New Haven, and the Pennsylvania main line out of Philadelphia. The Pennsylvania Terminal and the New York Central use the third rail for power transmission.



© Keystone View Company

THE DE WITT CLINTON RUNS ONCE MORE

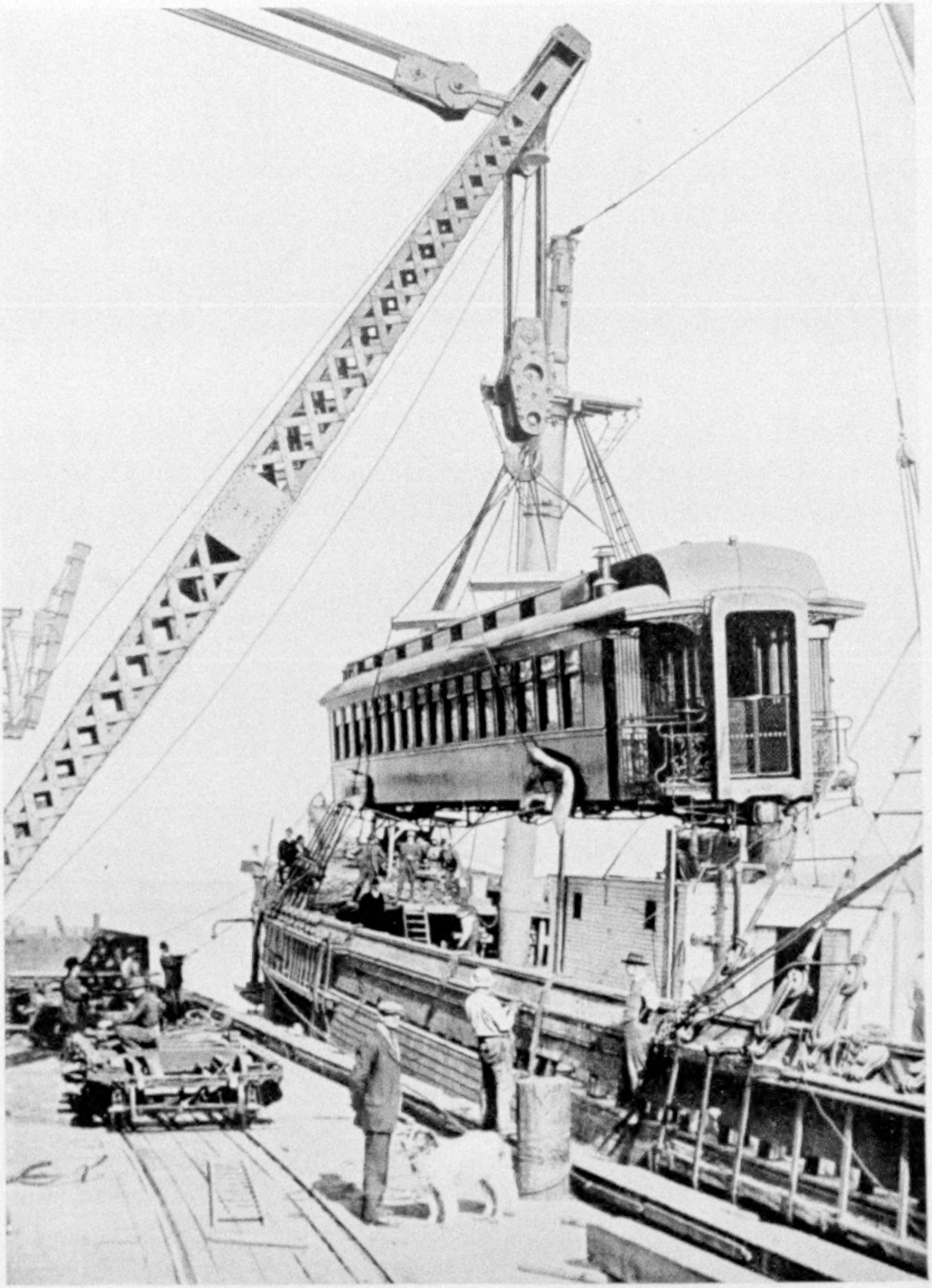
This ancient and honorable train recently left its comfortable "siding" in the great hall of the Grand Central Station and took to the rails, under its own steam, for a little airing below Riverside Drive. It made eight miles an hour between 96th and 116th streets. Later it was loaded on cars and taken to Chicago. When railroads were first built it was solemnly decided by the London Philosophical Society that trains could never be permitted to run more than twelve miles an hour, since a greater speed would drive crazy all the people who chanced to live in the neighborhood of the right of way.




WHEN A LOCOMOTIVE GOES TO THE HOSPITAL

Pulling trains day after day takes a heavy toll out of the engines. More than a fourth of the locomotives in the freight service are always either in the "engine hospital" or awaiting their turn to go there. The average engine burns 243 pounds of coal for every mile it runs.

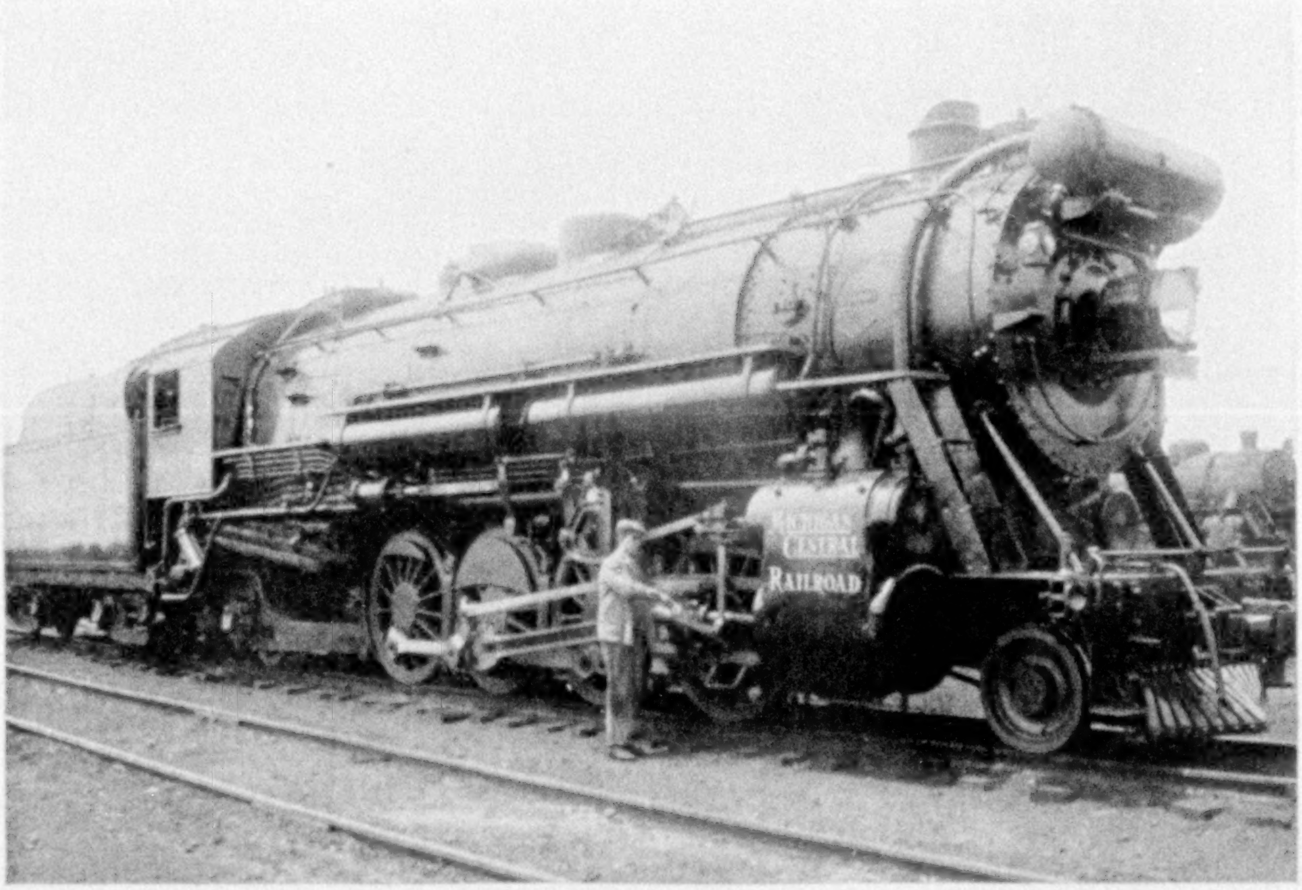
XUM



Photograph from Ewing Galloway

LOADING A PASSENGER CAR AT SEATTLE FOR SHIPMENT TO ALASKA

Alaska as a tourist resort is one of the certain developments of the future. The railways already built there, including the Government line, bring one to the front door of some of America's finest scenery in this immensely important part of Uncle Sam's domain.



Photograph by Publishers' Photo Service

A BIG ENGINE OF THE MICHIGAN CENTRAL

A locomotive's efficiency is largely determined by the proportion of its weight which it can put on the drivers. With such heavy trains as modern traffic requires, an engine must have a powerful grip on the rails.

instead of the 23 they have been making. They want to increase the average load by 2.2 tons, and to cut down the average daily number on the "sick list" from 7 per cent to 4 per cent.

This would appear to the layman a very easy task. Yet the railroad man realizes that it is vastly more difficult than it seems. The fact is that thirteen-fourteenths of a car's year is spent off of the main tracks, either being switched around some yard, being loaded or unloaded, undergoing repairs, or just standing idly by waiting for something to turn up.

HOW A FREIGHT CAR SPENDS ITS TIME

Of its year the average car spends fourteen weeks on loading and unloading tracks; six weeks being switched into and out of trains and onto and off of loading tracks; two weeks awaiting shippers' orders; five weeks working its way through the maze of division yards; nine weeks in delivery from one road to another.

Then there are three weeks more lost by its arrival at its destination on Sundays and holidays, and five more while going through the repair shops. Slack seasons cause it another two weeks of idleness.

These items show forty-six weeks out of the year spent off of the road. Of the remaining forty-three days, which represent its gross time on the road, eleven may be counted off for time spent running empty in search of a load, and five more may be deducted for delays incident to washouts, congestion, and the like.

All of which so taxes the car's time that it is able to spend only 27 days of actual running under load, and all of which tends to make an average of 30 miles per day a hard one to attain.

Thirty tons per car, the second aim of the railroads to-day, is almost as difficult of realization as 30 miles per day. Even under the severest stress of the war period, when every shipper made it a point of patriotism to get his cars loaded to capacity, it wasn't possible to reach that standard of loading efficiency.

© by Ewing Galloway

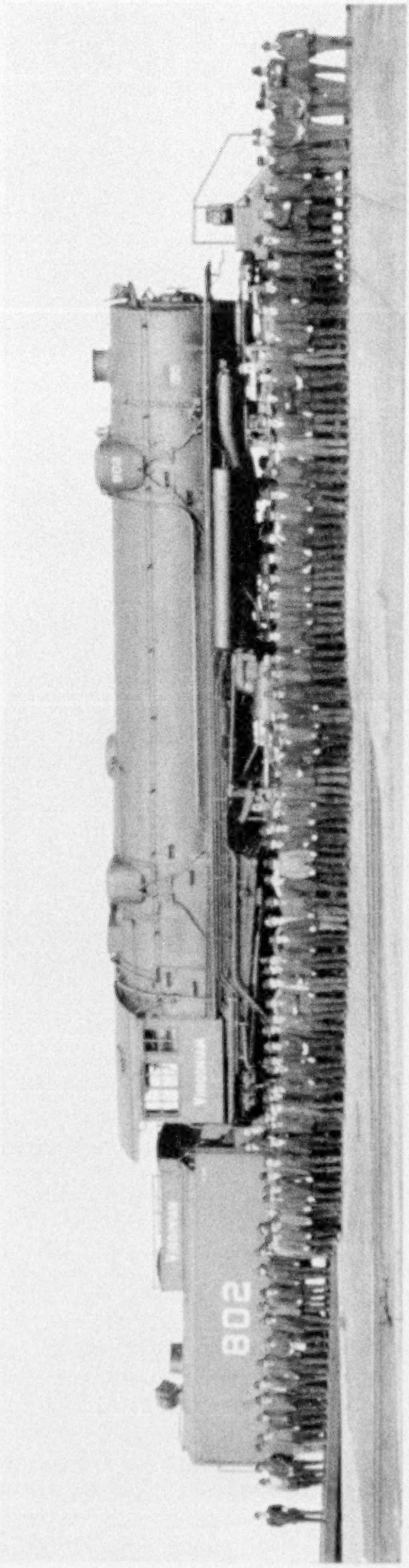
TANK CARS AT A LOADING STATION: EAST CHICAGO, INDIANA

Although a large percentage of our oil moves by pipe line, the railroads annually handle more than 1,000,000 carloads of refined petroleum and nearly 200,000 carloads of the crude product. The petroleum train required to move a year's product would be, with its motive power, more than 10,000 miles long.

In the first place, a stock car carries less than 10 tons of hogs, less than 11 of sheep and goats, and less than 12 of horses and mules. Likewise, box cars load less than 13 tons of hay and straw, cotton, wool, and eggs. On the other hand, coal cars force the average loading upward. During the second quarter of 1920 they moved more than 50 tons of bituminous coal, nearly 48 tons of anthracite, and more than 51 tons of iron ore.

The third aim of the railway managers is to shorten the time lost by the cars forced out of service by bad condition. It is estimated that by a little careful scheming the average car's "sick leave" can be cut down to 14 days a year.

If the slogan of "30 miles per day, 30 tons per load, and 14 days for 'sick leave'" could be transformed into an achievement, the railroads would have additional service out of its cars already in commission equal to that which could be rendered by 260,000 new ones. An




THE LARGEST "IRON HORSE" IN THE WORLD

This tremendous steed of the rails is the one that hauled a 17,500-ton train across south-side Virginia (see page 367), thus setting a world's record that will probably hold good longer than most railroad records do. It was built at the American Locomotive Works.

additional mile per day would equal the mileage of 100,000 new ones; an additional ton per day would give as much service as 80,000 new cars could render, and the reduction of "sick leave" to 14 days would yield the same results as the addition of 80,000 new cars.

### "TRAMP STEAMERS" OF THE RAILS

Freight cars have a way of wandering from their own lines and becoming the rail counterparts of tramp steamers. When the demand for cars is acute, it is very much cheaper for a railroad to keep a "foreign" car than to return it to its home line; for the "per diem" charge for a foreign car is only one dollar a day.

Not long after the outbreak of the World War a St. Louis car-builder had an order for some freight cars from a California road. He started one west loaded, to save haulage charges. It delivered its load and then began to wander around. It made two or three trips to the Atlantic seaboard, a half dozen up and down the country, and finally, long after the armistice, reached its destination. There are instances of cars wandering around the country for seven years before setting wheels on home rails once more.

The freight car is the Cinderella of the transportation household. The passenger car flits about at high speed, day after day, and never would be able to support itself except for the toiling of its humble sister. If the passenger trains had to pay their half of all the expenses of railroad operation—for they make half the train mileage—they would show one of those dreaded red-ink balances in the profit-and-loss account.

The average passenger car runs far enough to make two trips around the earth every year, and some of them run for a full generation—first, usually, in the big express trains, then on the main-line locals, and finally out on some "jerk-water" branch or in the dollar-excursion equipment.

### HAULING THE NATION'S FREIGHT

Turning from tracks and rolling stock to freight, one finds an equally startling story of the amazing proportions of railroad transportation.

A FREIGHT YARD IN THE ANTHRACITE REGION: CARBONDALE, PENNSYLVANIA

Coal, coal, coal, and more coal! One carload of freight out of every four that the railroads haul is coal to supply America's demands for heat and power. It is an interesting fact that there is a close agreement between the number of train miles, the number of tons of freight, and the number of passengers hauled by the railroads of the United States. In 1920 the Class I railroads, which embrace all but a few minor short lines, moved their trains 1,237,000,000 miles, hauled 1,255,000,000 tons of freight, and carried 1,234,000,000 passengers.

BUILDING THE EMBANKMENT APPROACH TO THE BURLINGTON'S BRIDGE ACROSS THE OHIO RIVER AT PADUCAH, KENTUCKY

The modern methods of making the high fills that save heavy grades are as much in advance of the old mule-and-scraper method as the Burlington's Southeastern Express is ahead of the first train the C., B. & Q. ever sent across the Missouri River.

The national balance sheet of work accomplished in 1919, which year is taken as the most nearly normal of any since the armistice, showed that 1,096,000,000 tons of freight were loaded into cars, and that the average ton was hauled 301 miles.

That represents the loading of a pile of merchandise as big as the great Pyramid of Cheops and hauling it from Washington, D. C., to New Haven, Connecticut, every eighteen hours.

If we could load the tremendous store of freight that moves in a year's time into one string of cars, it would be 312,000 miles long.

Imagine, if you can, a huge transcontinental railroad yard, stretching from New York to Seattle, via the meanderings of the Pennsylvania and the St. Paul, through Pittsburgh, Chicago, Milwaukee, St. Paul, Butte, and Spokane; and then imagine one hundred tracks in this vast continent-spanning yard packed solid with cars—box cars, coal cars, tank cars, refrigerator cars, stock cars, and flat cars—each and every one of them filled with the products of a nation's industry! That will give you a picture of the vastness of the interchange of commodities between the communities of a busy nation.

Forty of these tracks would be filled with the products of the nation's mines, 29 with the merchandise of its factories, 18 with the commodities that come from its farms, and 11 with forest products.

## ITEMS OF OUR ANNUAL WAY BILL

If one wishes an itemization of some of the individual commodities included in those major groups, it may best be given in terms of trains standing in this imaginary transcontinental yard, with cabooses resting on the banks of the Hudson.

The butter and cheese moving by freight (there are no statistics of commodities moving by express) would fill a train reaching almost to Huntingdon, Pennsylvania.

The American hen gives the railroads more traffic as a producer of eggs than the American cow contributes through her output of butter and cheese, for the

© Ewing Galloway

A CAR DUMP IN A BALTIMORE FREIGHT TERMINAL

The old-fashioned method of shoveling grain out of cars is getting too slow for these modern days of heavy freight traffic, and the grain dump has come to keep company with the coal dump. A whole carload can be sent to the bins in a jiffy.

egg train would exceed by more than a hundred miles the length of the one carrying butter and cheese, and would reach considerably beyond Johnstown. There are no comprehensive statistics which would enable one to estimate the length of the annual milk and cream train, as these products are hauled largely by express.

Our love of "something to drink" brings to the railroads more traffic than our demands for something to wear, the textiles requiring some three thousand fewer cars than beverages, which would load a train reaching from Hoboken, New Jersey, to Alliance, Ohio.

The annual freight traffic in horses and mules, despite the competition of the automobile, sends some 80,000 carloads over the rails—enough to make up a train reaching to a point considerably beyond Bucyrus, Ohio—while the train required to represent our citrus-fruit movement would stretch from Hoboken, New Jersey, to Lima, Ohio.

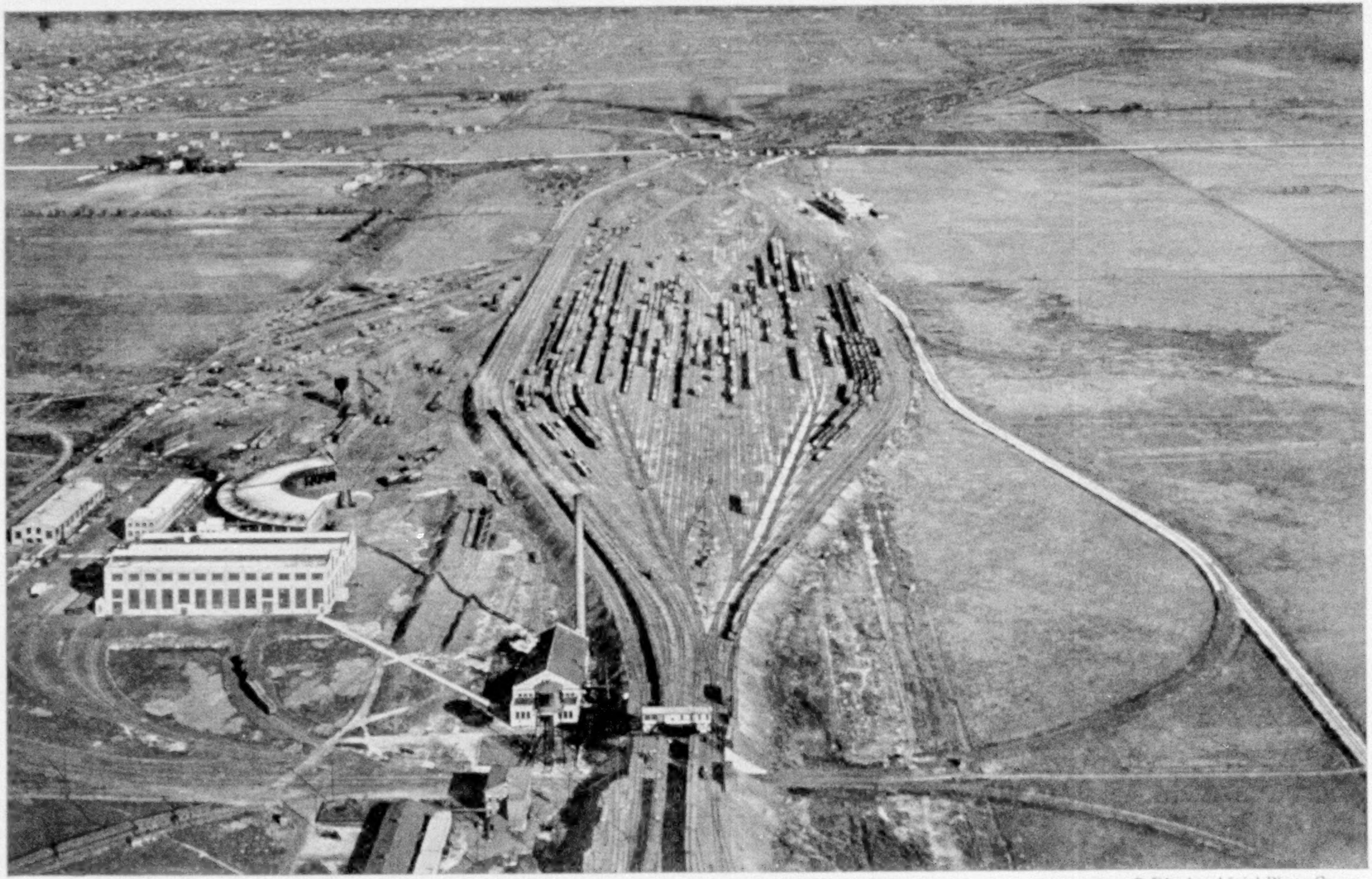
American devotion to "my lady Nicotine" contributes considerably to the traffic task of the railroads. In a recent year more than 90,000 carloads of tobacco and tobacco products moved by freight, and the train required to move it would be some 750 miles long—extending all the way to Fort Wayne, Indiana.

That we are considerably addicted to the use of canned foods is shown by the fact that those moving by freight in a recent year would fill a train reaching from the banks of the Hudson almost to the banks of the Wisconsin.

The American sweet tooth, likewise, is well catered to by the railroads. Sugar, syrup, glucose, and molasses moving by freight during a single year yield nearly 200,000 carloads of traffic—enough to make up a train whose headlight would illuminate the banks of the Missouri River at Mobridge, South Dakota, while its caboose was still in the Jersey City yards.

Even at that, the humble potato can go

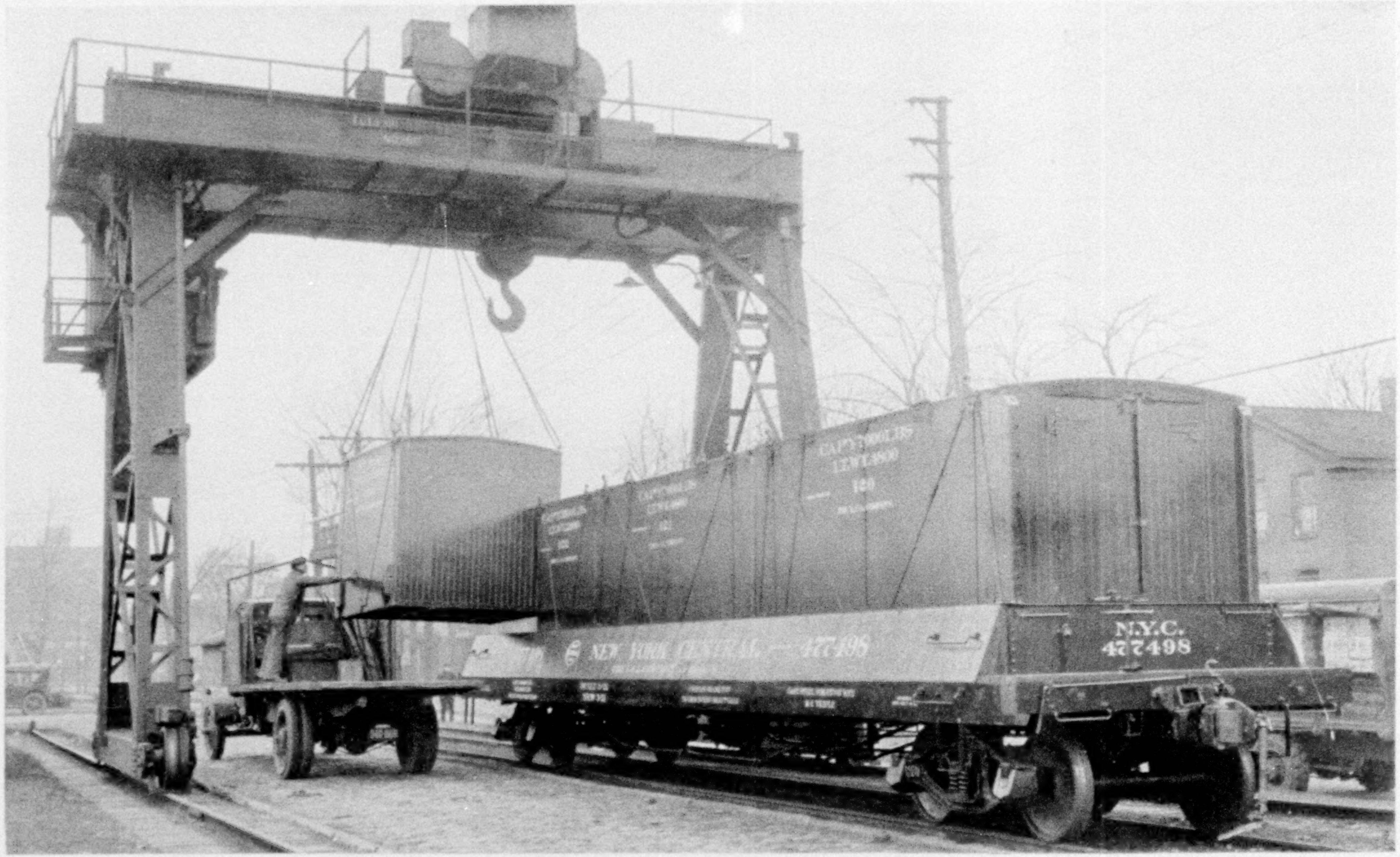
XUM



© Diggins Aërial Photo Co.

AN AIRPLANE VIEW OF THE CLEARING EAST CLASSIFICATION YARD, NEAR CHICAGO

This picture shows the layout of a modern classification yard. Two trains to be "broken up" and their cars made up into other trains may be seen in the foreground. The "hump" (see text, page 391) is on the near side of the little house spanning the tracks in the foreground, and the slope runs down into the yard. Up in this bridge house are men who operate electrically controlled switches. They press a given button, the corresponding switch is set, and the cars intended for the train being made up on the track which this switch opens are uncoupled and allowed to roll by gravity to their appointed position. Clearing Yard, as a whole, is five miles long, contains 180 miles of track and 799 switches, and can handle 10,000 cars a day.

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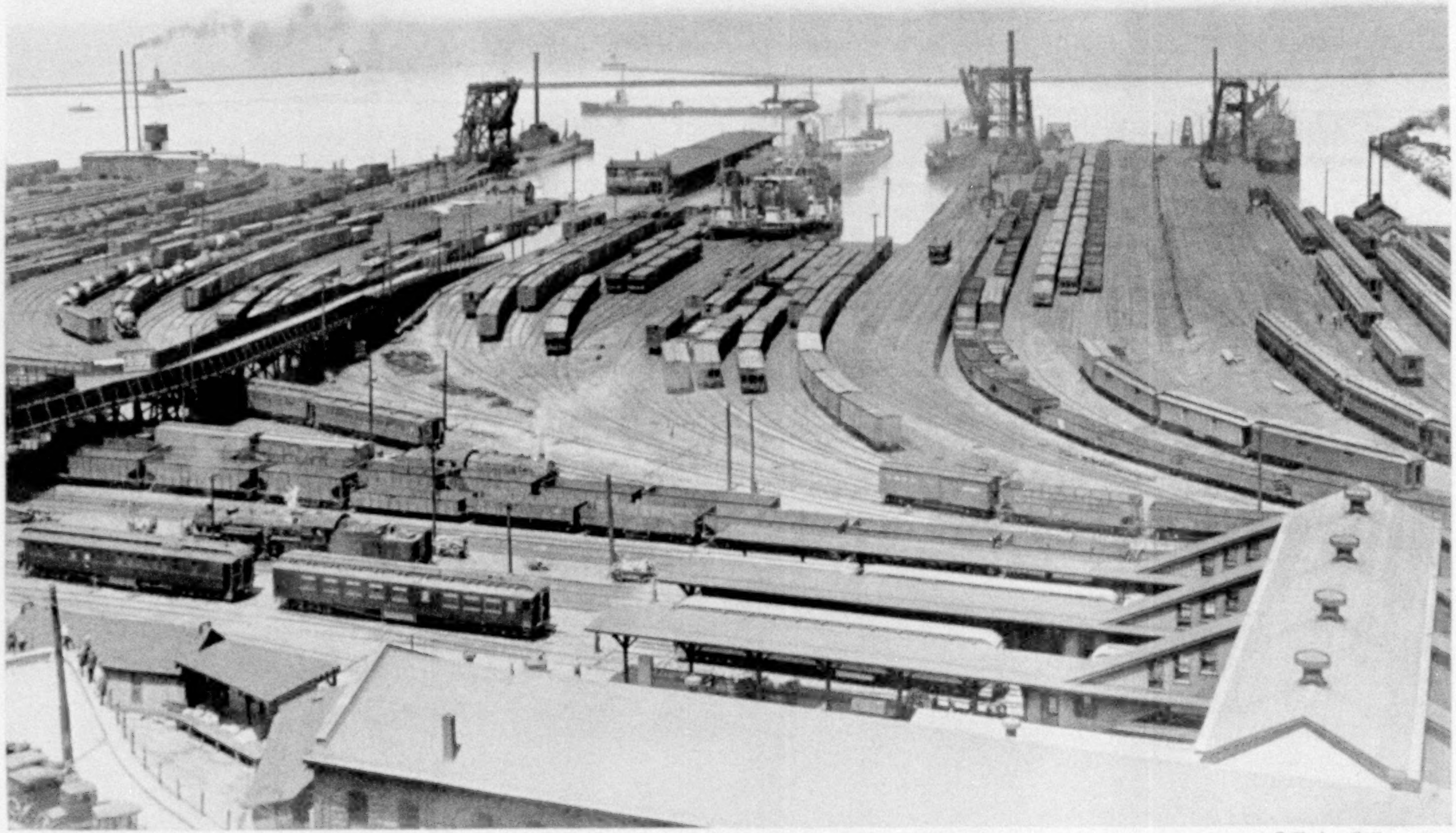
A "CONTAINER CAR" OPERATING BETWEEN NEW YORK AND CHICAGO

A new departure for "L. C. L." (less than carload) shipments is the burglar-proof container car, consisting of several sections, each of which is loaded by the shipper, at his plant, and hauled to the freight yard by truck. Here the several sections are put on a specially designed flat car and shipped to their destination, where they are transferred to other trucks and delivered unopened to the consignee. This saves numerous handlings and many damage claims.



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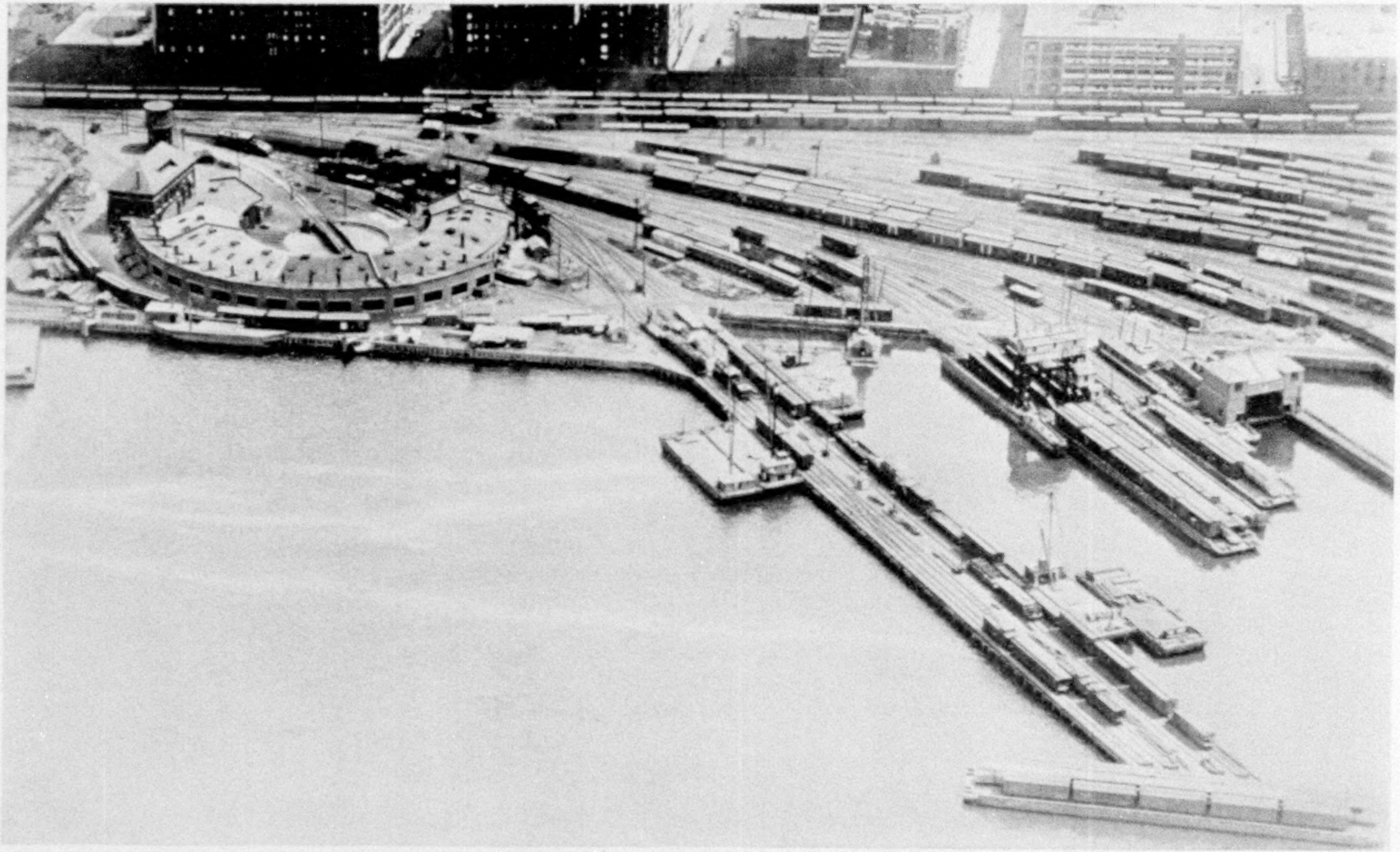
RAILROAD YARDS AT CLEVELAND, OHIO

The "Big Four" of the farm belt are the Burlington, the Milwaukee, the Rock Island, and the Santa Fe. These four roads handle more farm and animal products than any other four roads in the country. The Burlington handles more than nine million tons of this class of freight annually, as compared with less than five million tons for the great Pennsylvania System. The Rock Island handles nearly seven million tons, compared with less than four million for the New York Central.



AN AËRIAL VIEW OF THE WEST 72D STREET FREIGHT YARDS, NEW YORK, SHOWING A BIT OF RIVERSIDE DRIVE IN THE UPPER LEFT CORNER

Below Riverside Drive is a roundhouse, "the iron horses' stable," where some twenty engines may be sheltered. In the lower right corner is a car ferry. The canteloupe loaded into a refrigerator car in Arizona requires about two pounds of coal to bring it to an Atlantic seaboard breakfast table, while a half-pound of ice and locomotive fuel is used in bringing an orange from the Imperial Valley orangery to the Boston market.

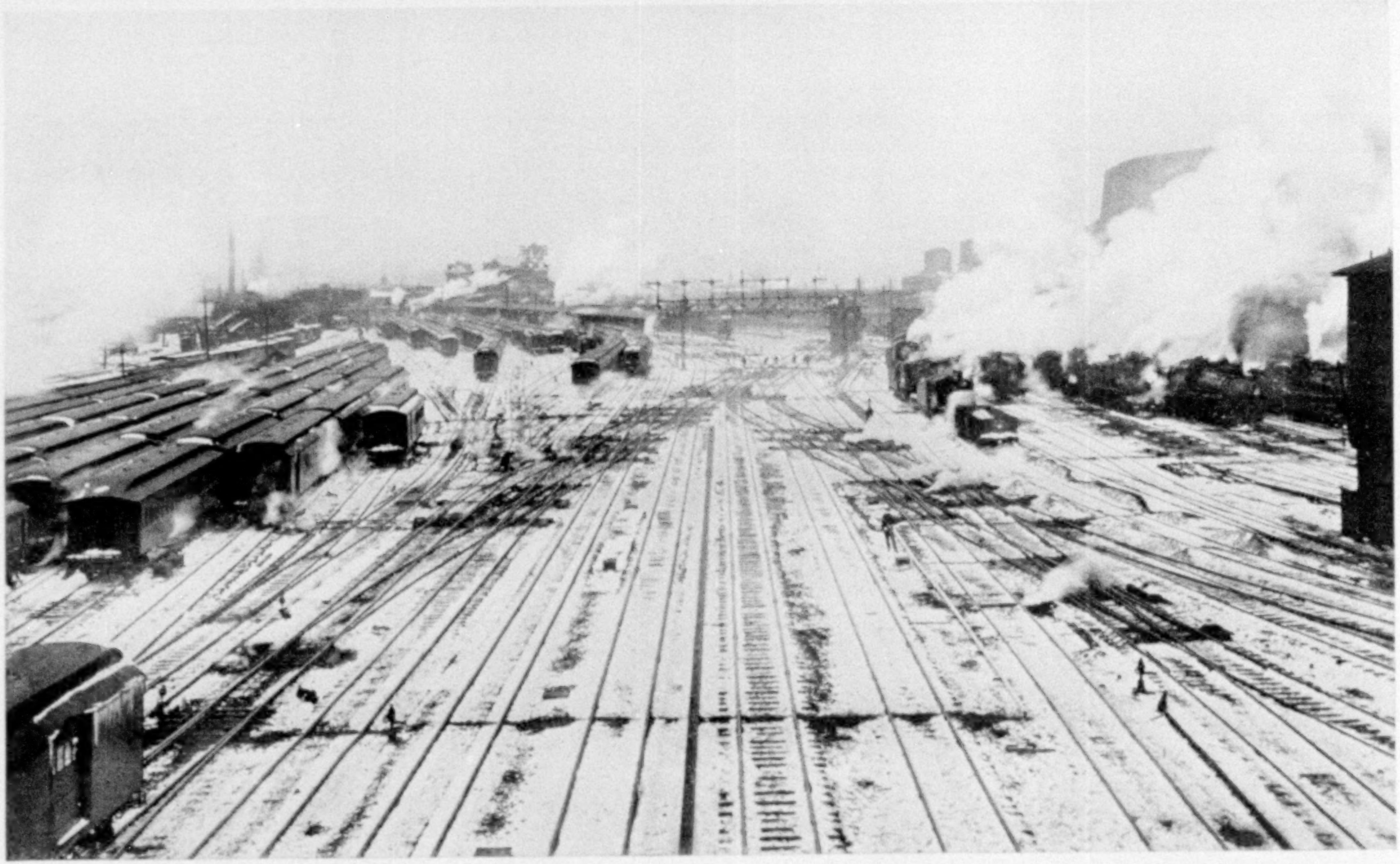
A ROTARY SNOW PLOW IN OPERATION

The railroads have their hardest struggles when the heavy snows begin to fall. In the Pacific Coast mountains, snow 20 feet deep on the level is not unusual. Only the big rotaries, driven by one or two big engines, will suffice to pierce the big drifts that so frequently occur. Sometimes it takes 60 minutes, even with these giant machines, to go 60 feet in attacking such drifts.

Photograph by International

ICE-COVERED LOCOMOTIVES JUST IN FROM A WINTRY RUN

Running a big express is a nerve-straining occupation. Curves to be looked out for, signals to be watched, interpreted, and acted upon, and the conditions of the track to be studied every minute, call for "a hand upon the throttle and an eye upon the rail" at all times. But when the driving storm, with its snow, or sleet, or rain, descends upon the right of way, the men who handle a train must call up the last ounce of their nerve and energy, if the precious cargo is to be brought to its journey's end without mishap. Eight million dollars is a hard winter's toll for driving from the railbeds of the United States the snowflakes that hinder traffic.



JERSEY CITY TERMINAL EQUIPPED WITH ELECTRO-PNEUMATIC INTERLOCKING SIGNAL SERVICE

The safety devices installed by the railroads in their big terminal yards to expedite the handling of cars and trains are marvels of ingenuity. When the winter snows come a tremendous task follows in their wake. It is comparatively easy to clear a right of way by pushing the snow aside, but in the big yards it must be gotten rid of entirely (see text, page 391).

our sweet goods one better, requiring nearly 25,000 more cars. Our annual potato train is more than 1,800 miles long and would reach to a point within 100 miles of the Montana border.

The American hen, in addition to her egg contribution to the freight traffic of the country, makes a second large contribution; the train required to move the poultry she offers would fill a track reaching from the banks of the Hudson to the foothills of the Rockies.

The ice moving by rail as freight is a very small percentage of that used by the American people, and yet the cars required for its movement would fill a track reaching well into the valley of the Yellowstone, while the cotton train's forward engine would be farther west than the western boundary of Yellowstone National Park. The products of the American packing towns would fill a train reaching from New York to Spokane.

The automobiles and trucks moving by freight would fill one solid transcontinental train and a second one reaching to Pittsburgh, while the wheat so moving would fill one transcontinental track and another one reaching half way across the continent.

Iron ore would demand 4,300 miles of cars, while coal and coke would require a train 40,000 miles long.

The variety of the requirements of the American people is no less remarkable than the volume of those requirements. On the list of commodities hauled by the railroads there are more than 8,000 different items, which embrace every kind of product, from abas, worn by Arabs as garments, to zymoscopes, used by zymologists as ferment-testers.

### WHERE THE GEOGRAPHIC COMES FROM

Under the blessings of adequate transportation the interchange of products is amazing. For instance, take so simple a thing as your copy of the NATIONAL GEOGRAPHIC MAGAZINE.

The paper is made in Massachusetts, from pulp-wood grown in Canada, treated with acids coming from half a dozen States, and coated with clays coming from England and Florida.

It is printed with presses made of steel wrought in Pennsylvania, from pig iron extracted in Ohio, with the aid of limestone from Michigan and coal from West Virginia, from ore mined in Minnesota.

The glue for the rollers of the presses comes from the trimmings of skins brought from India, China, and South America, including goatskins, beef hides, and horse hides. The glue for pasting on the cover comes from Pennsylvania, where it is manufactured from raw materials coming from as widely separated points as Cape Town, South Africa, Aden, Arabia, and Buenos Aires, Argentina.

The ink is a lesson in geography all by itself. It is made of carbon gas black from Louisiana; linseed oil from Minnesota, Argentina, and India; mineral oils from many American oil fields; vegetable oils other than linseed, from the cotton belt and China; dryers from Brazil and Canada; dyes from various States; and gums from New Zealand, the Dutch East Indies, and the South.

The type metal is made of lead from Missouri, copper from Montana, tin from the Straits Settlement, and antimony from Japan.

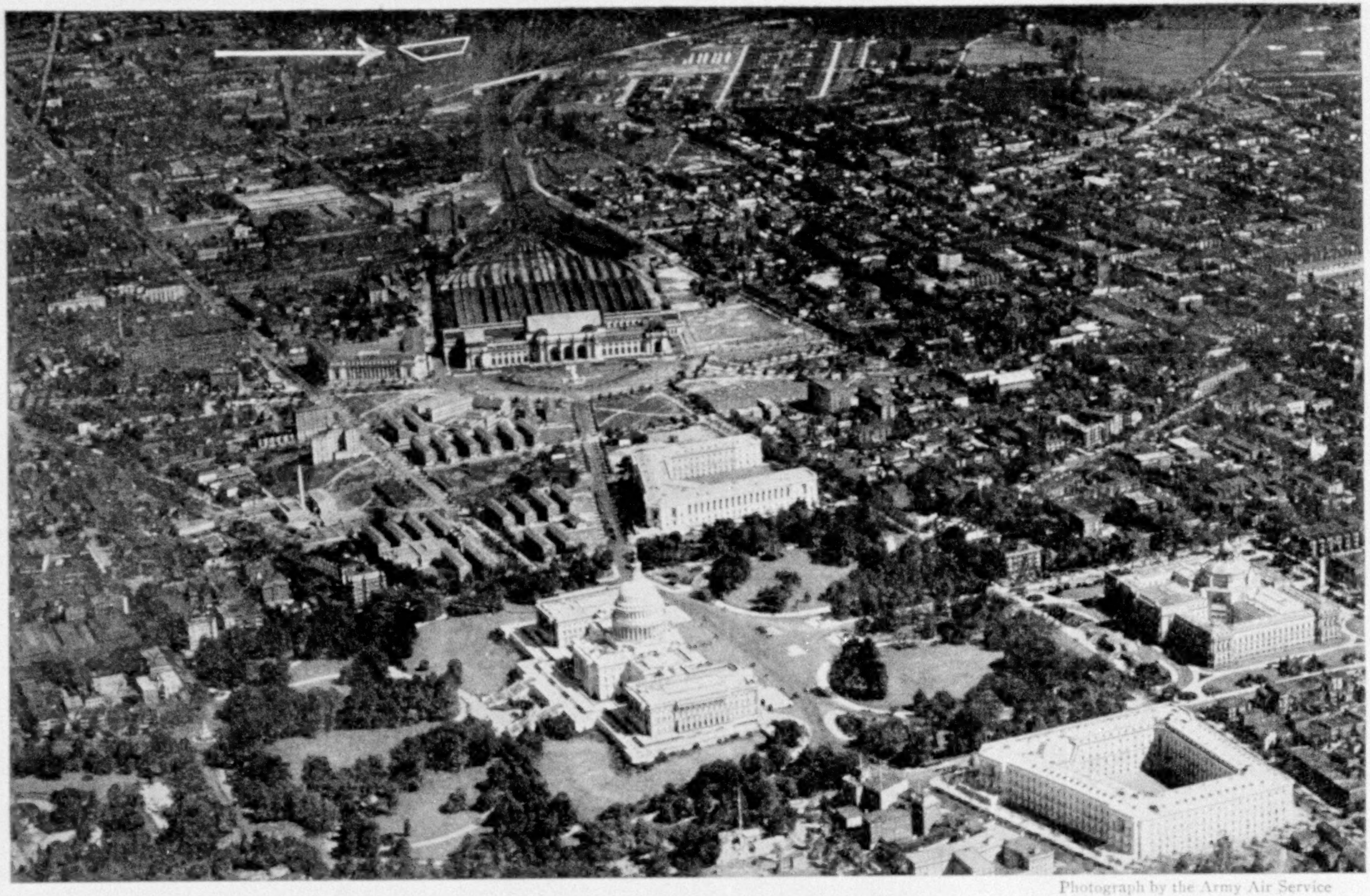
### WHY MOST OF OUR FREIGHT MOVES EASTWARD

Handling freight trains is an interesting task from the layman's standpoint, a hard one from the trainman's point of view, and an involved one from the yardmaster's aspect of the work.

With a tremendous export balance and such a large percentage of the country's population massed along the eastern seaboard, it is inevitable that much more freight has to move eastward than is dispatched westward. How to keep the car supply adjusted without unnecessary westward movement of empties is one problem, and how to prevent empties from moving eastward after they have discharged westbound loads is another.

In a recent year the freight trains of the country ran, in round numbers, 51,000,000 hours. Each train ran about 72 miles a day at 10.5 miles an hour, including stops and waits.

The making up and breaking up of the vast number of trains that move each 24 hours are constantly being accelerated through the installation of improved freight yards.



Photograph by the Army Air Service

THE UNION STATION AND ITS ENVIRONS, WASHINGTON, D. C.

No railroad terminal in the world has a finer setting than the Washington Union Station. In the foreground is the splendid United States Capitol. In the lower right corner is the House of Representatives Office Building, and above it the magnificent Congressional Library. Between the Capitol and the station are the Senate Office Building and the group of small structures known as the Government Hotels for Women Employees. To the left of the station are the City Post-Office and the Government Printing Office. In the background, indicated by the arrow, is the National Geographic Society's Eckington Annex, adjacent to the freight tracks, from which 4,500 tons of paper were delivered for use in The Geographic last year.

Formerly, all tracks in these yards were level, and a train was broken up or made up, as the case might be, only by innumerable switchings back and forth. In the new "hump" yards much of this is done away with. A train comes in off the line. It is backed up to the top of a steep grade. Here, mayhap, a score of tracks spread out from the one on which the train stands, each connected with it by a series of switches, or a "ladder," as these switch series are known in railway parlance.

Then one by one or group by group the cars in the train are uncoupled and allowed to roll by gravity down the ladder and onto the several tracks on which all cars of common destinations beyond are being gathered. These tracks are known as classification tracks. To one go the cars bound through to Chicago; to another those with St. Louis as their destination; to still another those having transcontinental destinations. And so it goes (see illustration, page 382).

GETTING FREIGHT OVER THE ROAD IS NOT CHILD'S PLAY

Whether the cars being sent by gravity down the incline and onto their respective tracks are from a train that has just rolled in or from scores of sources, each goes to its particular track, and one switching crew with one engine does the work that six crews and engines do in the old-fashioned yards.

And it is well that things can be speeded up, for in 20 years the freight business of the American railways has increased threefold and is still expanding.

In one yard not long ago 121 eastbound trains, with more than 3,200 cars, and 78 westbound, with 3,600 cars, arrived in 24 hours—a train every 7½ minutes; and of course these had to be broken up and made over into about as many other trains.

To the train crew the caboose is a "hack," and most crews have their "pet hacks." When the end of the division is reached they usually get a load back, but if there is nothing in sight the engine runs "light" back to the other end, sometimes taking the caboose along.

Getting freight over the road is hard work at best. Ask the firemen who have to fire the engines through the Baltimore tunnels of the Pennsylvania how often one of their number shows up unconscious after a trip through these gas-filled bores. Ask the brakeman who has to toil through the night with rain and cold as companions as he walks the long platform atop his train.

But at worst, think of 40 transcontinental trains snow-bound and idle in the single State of Wyoming! Think of 25 feet of snow on the level and 50 in canyons and gulches! Think of thermometers in which the mercury tries to hide itself from the frost, in weather where zero temperature would seem moderate by contrast!

Yet through it all the engineer must have an unobstructed vision; the fireman must shovel an unwonted quantity of coal into the firebox; the brakeman must protect his train, operate his switches, and always be ready if the air-brakes should fail to work. Water tanks become masses of ice without and freezing water within.

On one line 40 miles of telegraph poles were broken down by a snow and sleet storm, most of them falling across the tracks. On another every bridge and trestle for miles was carried down stream by an unrelenting downpour.

Snow time is worst of all. When the weather forecaster sees a big snow storm in the offing he acts as intelligence officer for the railroads, and they begin to marshal their forces for the fray. Every engine in every roundhouse must have steam up, ready at an instant's notice to take the road and help to keep the rails clear. An ounce of prevention was never worth a fuller pound of cure than in fighting the snow. The division superintendent becomes a general, and mobilizes the last ounce of his reserves in motive power and men.

Trains are shortened, and the intervals between them cut down. If the flakes come too fast for such strategy in keeping the line open, the engines are equipped with ordinary plows, which buck the drifts and push them to one side.

But if the hordes of the snowflake armies become so numerous as to overwhelm even these, the big rotary plows are sent into the fray. These possess great cutting wheels able to drill a bore whose diameter will permit the passing of a train.

© Kadel and Herbert

A HOLIDAY CROWD IN THE GRAND CENTRAL STATION, NEW YORK

Only once in history have the doors of the new Grand Central Station been closed. That time a storm too heavy for even the greatest of railway organizations to conquer stopped traffic, and the string of commuters, waiting for a way to get home, was strung for miles down the avenues leading to the station. The station authorities figured that the people were safer in the snow outside than in a possible panic inside.

Shoved forward by perhaps three engines, a rotary plow eats its way into a big drift, discharging the snow through a giant nozzle that extends out over the right of way, and throwing a stream of flakes that would engulf an ordinary building in short order. Therefore it is built so that the nozzle-man can regulate the direction of his stream and thus avoid such catastrophes.

In the terminals and freight yards a snowstorm means frozen frogs and out-of-commission switches. Brooms, oxy-acetyline blow-pipes, and such have to be called into service, and a stiff battle must be waged if trains are to be kept moving.

Latterly, experiments have been made in the direction of installing electric heaters at switches, and one of the foremost terminal superintendents in the country tells me that he believes the day is not

THE GRAND CENTRAL STATION, NEW YORK

It looks squatty in contrast with the skyscrapers surrounding it, but a comparison with the taxicabs in front of it will show that it is a tall building. Furthermore, half of the station is below ground. Its walls have been constructed with a view to superimposing a tall office building above the present structure. Most of the adjacent buildings are a part of the Grand Central development (see text, page 397).

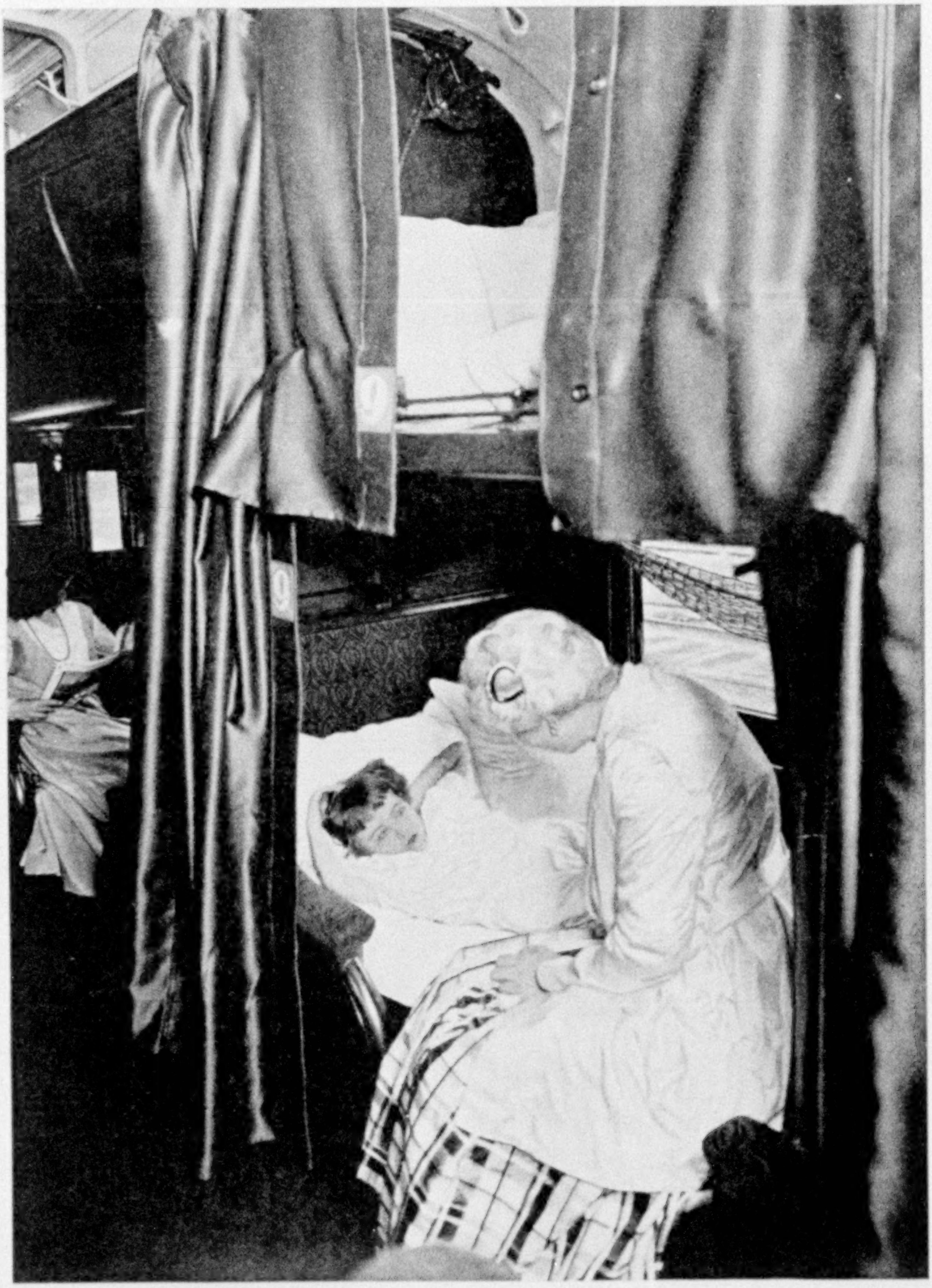
distant when snow will be deprived of its terrors, so far as terminals are concerned.

A VAST ARMY OF TRAVELERS

The story of the passenger traffic of the United States is one of a volume of business no less astonishing in proportions than the freight traffic.

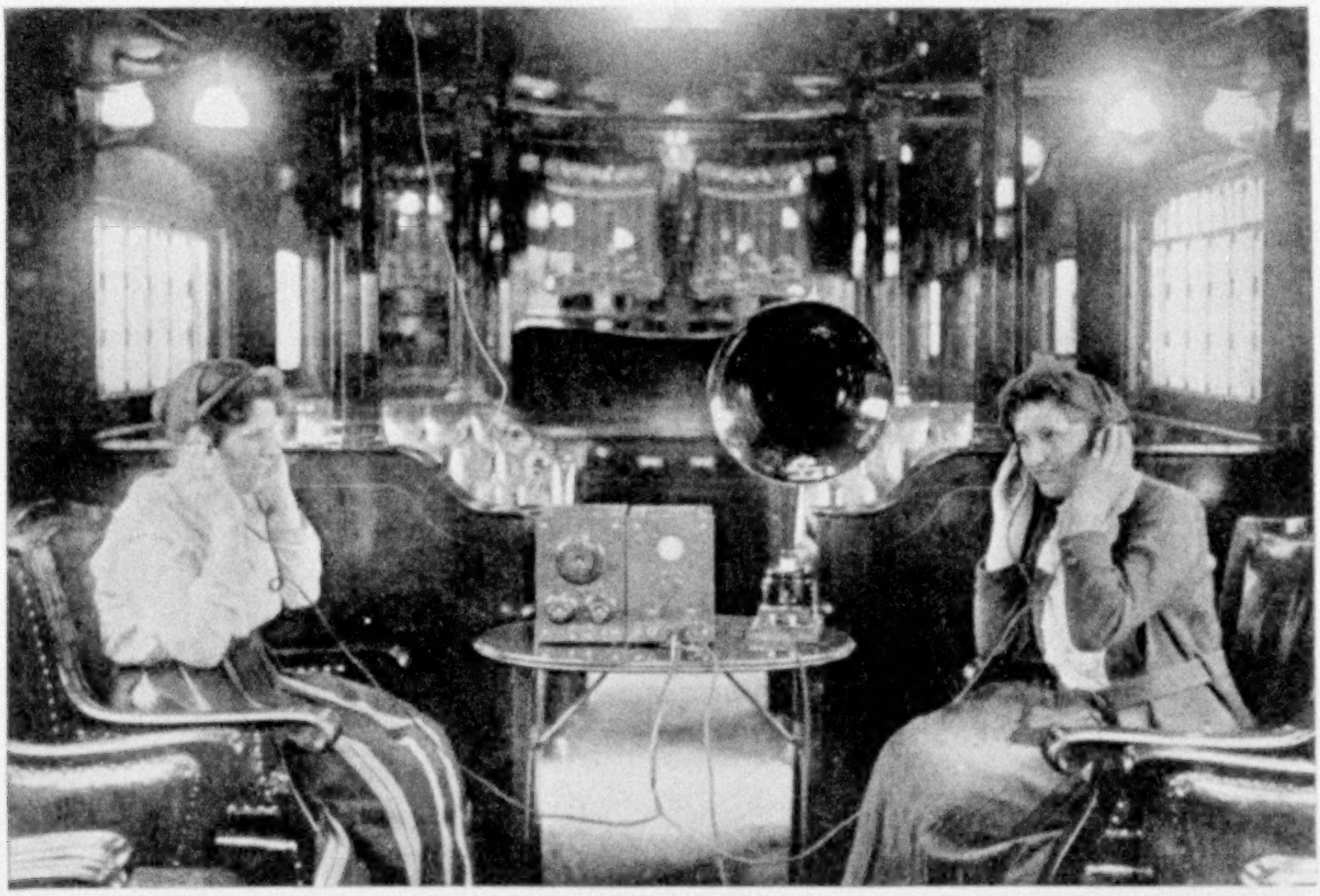
Imagine the vast array of folk who ride over the rails of the country in a year transformed into an army of marching troops, in solid formation and 257 abreast. The rear guard of that vast army would be waving their farewell to the skyline of New York as the advance guard was hailing the Golden Gate at San Francisco, if the line of march were an air line. Truly, 1,175,000,000 passengers is an imposing multitude of people!

And the aggregate miles they traveled! In its annual marathon around the sun, the earth is about the speediest thing we



A BERTH IN A REGULATION PULLMAN

The average passenger on the railroads of the country makes the equivalent of five round trips between Baltimore and Washington annually. The trains that carry him run faster, but are slower earners of money than the freight trains that must give him the right of way. The passenger trains earn $2.78 for every mile they run, against $6.81 earned by the freight trains.



Photograph from Kadel and Herbert

RADIO ON THE RAILS

Some of the progressive railroads are installing radio receiving stations on their big through expresses. It is now even proposed to put in a motion-picture service in dining-cars, so that when those who answer the last call of the "white coat" have finished their meals the car may be converted into a motion-picture theater for the benefit of those who have wearied of the car-window panorama and of the books and magazines they brought along to relieve the tedium of the trip.

know. It hurtles through space at so great a gait that it covers a distance equal to that which stretches between Ottawa, Canada, and Tallahassee, Florida, in a single minute. And yet, even with such a speed record, it cannot pile up mileage as fast as the American people in their railroad travel.

Indeed, if the earth were to speed up its gait eighty-fold its annual mileage would be no more than equal to the 46 billion miles covered by the travelers of the United States in a normal year.

There are many things about passenger traffic that constitute wonder stories of the transportation industry, concerning which lack of space forbids even a mention. The tales of the time-table, the baggage business, the ticket-sellers, the sleeping-car service, to say nothing of scores of other activities, must go untold.

But there is one phase of passenger travel that arrests the attention of everybody—that of the modern passenger station in a major city.

To visit one of these big terminals and there to study the art of handling vast throngs of humanity and amazing numbers of trains, to go down into the dispatcher's office, out to the information bureau, and through the whole plant, indeed is an experience not to be forgotten.

South Station, in Boston, with its 45,000,000 passengers and 196,000 trains a year, holds the American record for volume of traffic. North Station, in the same city, with its 32,000,000 passengers annually and 400 trains daily, holds the record for a station serving only one road. Union Station, in St. Louis, with 22 roads entering it, holds the record for the number of lines served.

But in their modernity, in the intricacy of the problems solved, in their construction and operation, in the probable future expansion of their patronage, no other

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WAR WORKERS IN THE RAILROAD YARDS IN JERSEY CITY

In 1916 the average railroad worker labored 3,151 hours and received $854.20. In 1920 he worked 2,630 hours and was paid $1,820. The railway army in 1920 was more than two million strong. One hundred men working every minute from the dawn of history to the present hour would not have put in as many hours as did the railroad employees in 1920.

stations in the world claim as much interest from the public generally as the Pennsylvania and Grand Central stations, in New York.

The Pennsylvania is the largest terminal under one roof in the world; but the Grand Central, with its two levels, covers double the acreage of the Pennsylvania. The latter was built as a railroad station pure and simple, while the former was constructed as a real-estate development, which should provide every possible convenience known in the art of transportation, and to surround the station with associated interests, such as hotels and office buildings.

The New York Tunnel Extension of the Pennsylvania, with the station and its appurtenances, cost about $115,000,000, while the Grand Central cost $75,000,000. By the broad idea of making a business center on the land redeemed by electrifi-

cation and that which had to be condemned to provide for the underground trackage, the Grand Central Station, with its group of surrounding edifices, has been made a self-supporting institution.

THE STORY OF GRAND CENTRAL STATION

A trip through the Grand Central Station is a revelation. Every day 600 trains arrive and depart; 33,000,000 passengers pass its portals in a single year. Its public rooms have an area of six acres and its main concourse could accommodate 15 regiments of infantry. Its facilities are so arranged that no passenger need retrace a step—ticket window, Pullman office, checking-room, all coming in their order on the traveler's way to his train.

While, of course, the primary purpose of the New York Central was to build a great station, with an ultimate capacity of upward of 75,000,000 passengers a year, yet electrification made it possible to reclaim 40 acres of land in the very heart of upper Manhattan—all over the two levels of the 32 miles of terminal tracks—and to utilize this area for the biggest single civic development in the history of architecture.

The main station building, whose suburban and express levels are connected by long inclines, or ramps, instead of by stairs, has a veritable labyrinth of inside streets and passages lined with shops and stores. One can, without going out of doors, reach three subways, three hotels with 3,000 rooms, a series of office buildings housing 6,000 workers, and two big university clubs.

Great as has been the development of the reclaimed areas by the construction of office buildings, hotels, clubs, stores, and apartment houses over the station and approach tracks, vast additional structures are expected to rise. Even the main concourse itself was built with a view of ultimately surmounting it with a 17-story office building.

One of the remarkable things about the construction of the Grand Central is that it was built as a substitution. The whole structure and its satellite buildings had to go up, their predecessors had to be torn down, and the substitution of electricity in the place of steam had to be wrought

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A FEMININE ENGINE-WIPER WHO LIKES HER JOB

The "housekeeping" of the railroads gives employment to thousands of women cleaners.

Photograph by International

RESULT OF A REAR-END COLLISION AT SULPHUR SPRINGS, MISSOURI

Automatic train-control devices that mechanically stop trains on the safe side of the danger line when the engineer fails to do so are in daily operation, with such positive results that the Interstate Commerce Commission is taking steps to make their installation compulsory on all the main railroads. These controls warn against defects in the tracks, causing broken circuits, as well as against defects in their own apparatus. Furthermore, they exclude all trains from any block occupied by another train. The Chicago & Eastern Illinois has had a whole division equipped for several years, with a record of not a single collision on the tracks thus protected.

THE OLD HAND-BRAKE METHOD OF CONTROLLING A TRAIN

Nothing has added more to the success of railroading than the air-brake. Some time ago a demonstration with a train of 100 cars, each of 120 tons capacity, was made. It was shown that air-brakes on even such a train could stop it more quickly and more smoothly than a man at every brake-wheel of the train could have done.

while passengers were coming and going and trains arriving and departing.

Vast yardages of stone and dirt were blasted and moved, amazing tonnages of structural steel and hollow tile and brick were removed here and put into buildings there, but traffic went on as though nothing could happen.

There are hundreds of superlatives about the Grand Central Station to which space does not permit even a passing reference.

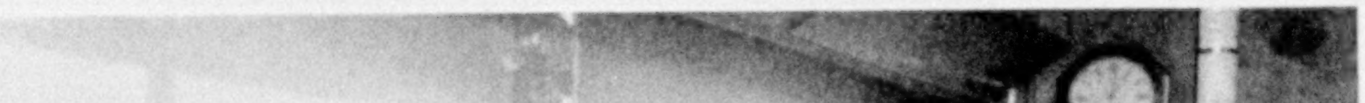
But surpassing everything else is its work of handling 600 trains that come in and go out every day. To get a faithful picture of that task, one must take a few notes to begin with.

The two-story railroad—for that is what it amounts to—in the terminal is entirely below the street level. The second story tracks are 34 feet below the street level and the lower story tracks 55 feet.

On the upper level there are 41 tracks

A MODERN INTERLOCKING SIGNAL TOWER

The interlocking signal system has contributed no mean share to the reduction of the time of trains between terminals. If they had to thread the modern maze of tracks in the average city, with every switch hand-thrown and every signal hand-set, accidents and delays without number would occur.



THE MEN WHO CONTROL A MODERN CLASSIFICATION YARD

This push-button machine controls the maze of switches and tracks of the clearing yard near Chicago (see illustration, page 382).

and on the lower 22. In addition to these, there are 62 other tracks on the two levels used for storing engines and cars, with a big loop on the lower level, built so as to permit trains to be turned around without shifting or backing out of the station.

Under the old way of railroading, men had to set switches and signals by hand, out on the track itself. Then came the tower, with its levers enabling a man to set them at a distance, but still by hand.

But manifestly, with 238 different sets of points and crossings, 570 signals, and 1,200 train movements, on 113 tracks, every railroad day, the very latest equipment had to be installed—indeed, had to be invented to meet the situation.

And the human element had to be eliminated. One slip of the hand, one lapse of the mind, and a wreck would be almost inevitable. So mechanisms had to be devised that would make it impossible for signals and switches to conflict. Plans had to be worked out that would make it impossible for one train to get into a block occupied by another.

The result was the development of what is probably the most complete switch and signal layout in the world. Men send trains in and out of the station without seeing them.

Some distance out of the station the four tracks over which trains come to Manhattan Island spread out into ten tracks, four of them leading to the suburban level, 55 feet below the street, in the station, and the other six to the through-train level. Here an interlocking tower controls the ten tracks. Three-quarters of a mile nearer the station, the four lower-level tracks spread out into 22 and the six upper into 41.

Here, under 49th Street, is located the largest interlocking plant in the world. The machine controlling the suburban-level tracks has 400 levers. That on the floor above has 376.

The director of these tracks has a long case before him, covered with frosted glass, on which is outlined the entire track and switch layout of the territory under his command. It is drawn to scale, and little lights at their appropriate positions tell the director the condition of each track, whether occupied or vacant.

Whenever a train passes over a switch, its lights go out and do not shine again until the wheels have passed over the next switch ahead and have extinguished its lights in their turn.

There are many levermen whose duty it is to manipulate the 400 levers that operate the switches and signals, as the director calls out the tracks he wants the trains to take.

These men see neither the tracks nor the trains on them, and possess no picture of the track transformation their operations result in. To put the average train onto its appropriate track in the station requires the manipulation of twenty-odd levers, each in its own particular order in the sequence, while some of the more complex berthings may take sixty-odd lever movements.

But so deft does practice make these men's brains that they never hesitate. They manipulate the levers as precisely as a professional pianist touches the keys of his instrument.

But even if the lever man were to try to move any lever of the combination out of its proper order, he could get no response from it, for it is so locked that it cannot be moved out of its sequence or wrongly.

Imagine a piano whose keys could be so interlocked that each note of each piece had to be played in its proper order!

The electric lights on the frosted glass chart are interlocked and arranged in such a way that the trains passing over switches automatically duplicate the track situation for the director.

### FOLLOWING A TRAIN INTO THE STATION

Let us watch a train coming into Grand Central Station from New Haven.

When it passes Mott Haven Junction the director of the big interlocking station at 49th Street gets a message telling him what kind of a train it is, how many cars, etc., and the time it passed the junction.

When the train reaches 72d Street it automatically closes a circuit that turns on an electric light in the director's cabin at 49th Street, advising him that it is ready to be a "guest in his house." He thereupon looks at his frosted glass diagram, determines what track is available, and calls out his orders to the levermen.

As soon as this is determined the fact is written on a telautograph, which dupli-

CASTLE GATE, ONE OF THE PICTURESQUE PASSES IN THE ROCKIES

The work of the men upon whom devolves the task of locating a railroad across the Rockies is dramatic in the extreme. Here they must be lowered into deep and forbidding canyons to plot the steel way; there they must climb precipitous slopes into the snow fields, to run their line; but all the time they must keep in mind the fact that when their work is done luxurious passenger trains and heavy freights are some day to pass there on curves so gentle that the soup of the fastidious folk in the diner may not be spilled, and over grades so easy that long strings of freight cars can be moved with a reasonable amount of motive power.

cates the information to the bulletin-board and other points around the station, advising the 200 or more porters, baggagemen, and others on what track and at what minute the train will stop.

Among loud-speaking telephones, telegraph instruments, and electric lights, the interlocking station director is a commanding general who is in constant touch with every sector held by his forces.

All the switches and signals must be set positively before the leverman at the "piano-box," as the mechanism is known, can lock the switches.

At the Grand Central Station trains leave on schedule time. No wait is made for belated passengers. The gates close and the train goes, each at a predetermined time. A red light near 45th Street signals the closing of the gates.

Photograph by International

THE CHIEF ENGINEER AT THE THROTTLE

President and Mrs. Harding have done less traveling than most of their immediate predecessors in the White House. When the railroads were turned back to their owners the Government released to them property that cost more than twice as much as the Allied debts to America, and which probably could not be replaced for twice their original cost.

Train dispatching at the Pennsylvania Station differs somewhat from that at the Grand Central. Here the tower spans the tracks and the tower director sees the trains he guides in and out of the station.

It is a fascinating experience, though one conducive to high stepping, to be privileged to go down through the maze of tracks and third rails to the big tower, where the trains are guided into and out of the big station.

Here one may see the whole track layout, from the New Jersey portal of the Hudson tunnels into the station. Instead of a frosted glass diagram, as at the Grand Central Station, one finds the tracks themselves in miniature. Every switch is in its appropriate place and every signal also; and as the leverman throws the switches on the steel highway itself, the ones on the brass miniature move in harmony. Every part is built, and every motion is made, to scale.

As one stands in the big tower a signal light goes out as a big limited leaves the Hackensack Meadows and begins its plunge under the Hudson. The director of the Jersey tower reports its passage and the station-tower director gives orders to the levermen, who set the switches for the track on which the train will roll into the station.

With watch in hand one observes the course of the train through the Hudson tube. As it starts into the tube the speed increases, as is shown by the rapidity with which the miniature signal lights go out and come on again, for the tubes swing down deep under the Hudson.

Then, as the lowest point beneath the river is passed and the train begins to climb the steep grade up to the east bank, it slows down rapidly. Light after light goes out, stays out until another ahead of it is darkened, and then shines again, proclaiming the fact that the block ahead of it is clear.

Presently in rolls the big limited, right under the big tower, and several hundred people flock out of it, little thinking of the wonderful mechanism that stands guard over the maze of tracks and switches and

never fails to send each train into its appropriate berth.

With regret one leaves untouched a hundred and one phases of railroad operation that would add to the picture of the vastness of the task of moving the nation's freight and carrying its passengers, as well as of the intricacy of the details of a year's transportation business. But the phases that have been considered are representative as well of those which must be passed by. The economics of railroad operation are beyond the scope of this article.

RAILROAD DEVELOPMENT IN AMERICA

The history of railroad transportation in the United States is a story of amazing development. At the outbreak of the Civil War the country had less than 31,000 miles of line, of which only about 2,000 were west of the Mississippi. It was not until February 22, 1863, that the first sod was turned in the projection of the first transcontinental line, on the Pacific end at Sacramento; and not until December 2 of the same year that work began in the Mississippi Valley.

Six years later, after many vicissitudes and after 225 miles of overlapping line had been built, an agreement was reached whereby the two companies joined forces, and the golden spike which tied together the East and West was driven at Promontory, Utah (west of Corinne), on May 10, 1869.

The railroads, indeed, constitute the key that unlocked the treasure-house of American resources. The story of the nation's rise to greatness and power is an account of a succession of frontiers.

At the beginning the frontier stopped at the Blue Ridge Mountains. The turnpike and the canal finally pierced these heights and let it move on to the Alleghenies. These became an isolating influence that held the pioneers in the eastern half of the Mississippi Valley almost a separate people from those on the Atlantic seaboard until the railroad builders' faith removed these mountains, as far as the flow of commerce and communication was concerned.

In turn the Mississippi River became the frontier. What was the good of the land west of the Father of Waters if that stream remained unbridged?

Even as late as the early eighties our people thought that it was useless to build railroads through western Minnesota and the Dakotas, arguing that the region was a desert in summer and a wilderness of snow in winter; and it took Custer's campaign against the Indians to persuade the public that the Northern Pacific extension beyond the Mississippi, at St. Paul, could be kept open more than five months a year.

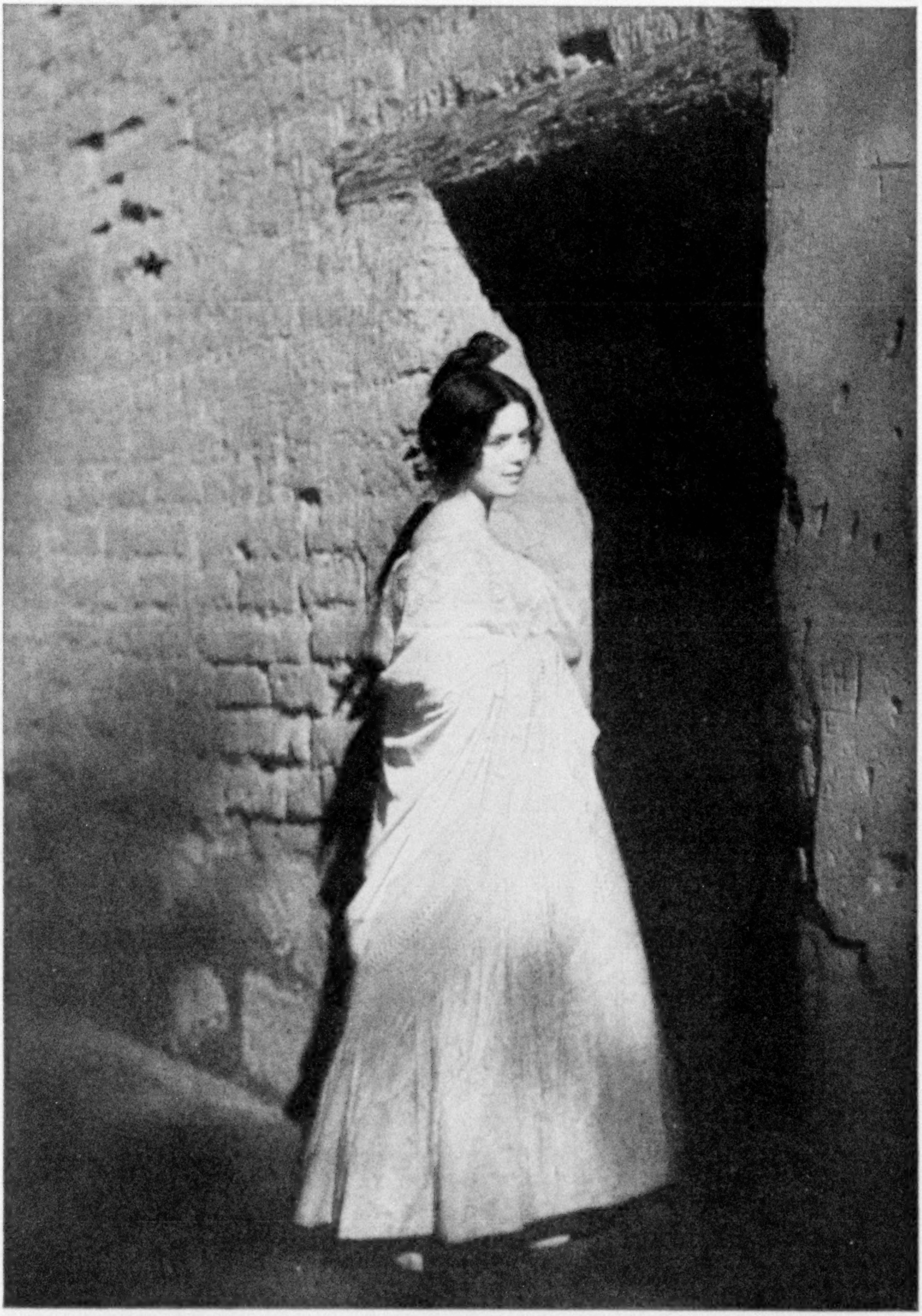
During the Civil War the South had much less than a third of the nation's railways. Furthermore, these linked up distant communities rather than industrial centers. Comparatively few of them were strategic, whereas the North had rail connections admirably fitted both for the movement of men and munitions and for the interchange of commodities essential to the fabrication of these munitions.

In Europe the history of railway construction has been that of roads laid down to meet the demands of traffic already there. In this country tens of thousands of miles of line have been built through virgin territory, which it was hoped would grow up to their facilities.

Linking the ore of the Minnesota mines and the coal of the Pennsylvania mountains, the farms of the Mississippi Valley with the markets of the Atlantic Slope, the trucking and fruit-growing districts of Florida and California with the consuming centers of the East and the North, the geography of railway traffic in America has been developed along lines that eliminate distance and make the whole United States one great homogeneous community, tied together by bands of common interest, as are the people of no other equal area in the world.

Far-flung as are the boundaries of the United States, it is now possible to interchange commodities between any two places within those boundaries with less transportation costs than were paid between relatively close communities a hundred years ago.

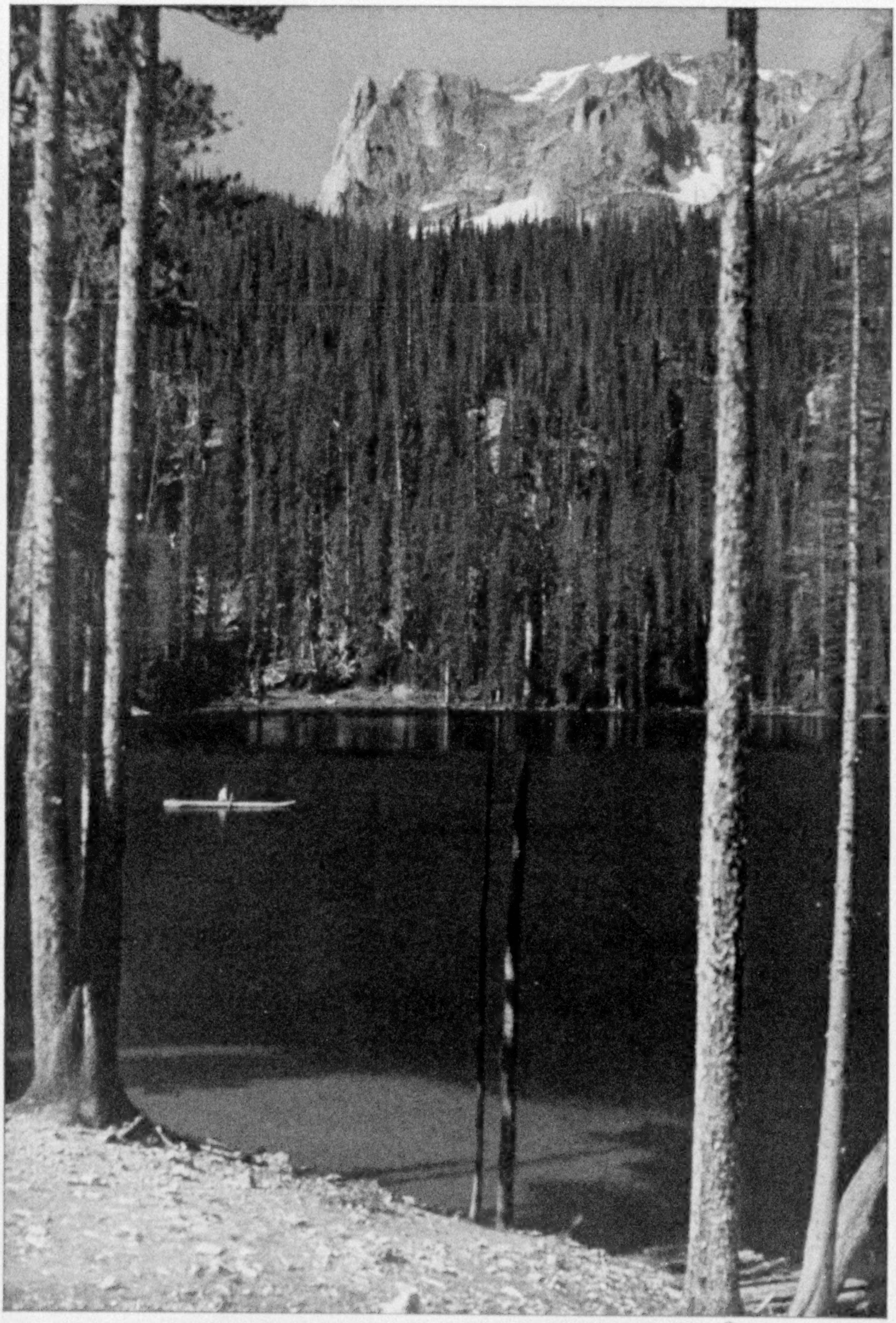
The United States has about one-sixteenth of the earth's land and an equal proportion of its population, yet it has nearly a third of the world's railway mileage. Its population is only one-fourth that of Europe, yet it has almost enough miles of line to duplicate the systems of Europe and Asia together.



Autochrome © Fred Payne Clatworthy

A DAUGHTER OF OLD SPAIN IN THE NEW WORLD

California's ancient missions are not that State's only tie with the land whose pioneering sons discovered many of its beauties and its marvels. One may still see now and then such charming Spanish types of womanhood as this, with coiffure and soft shawl reminiscent of days before the forty-niners brought the first touch of a new order.



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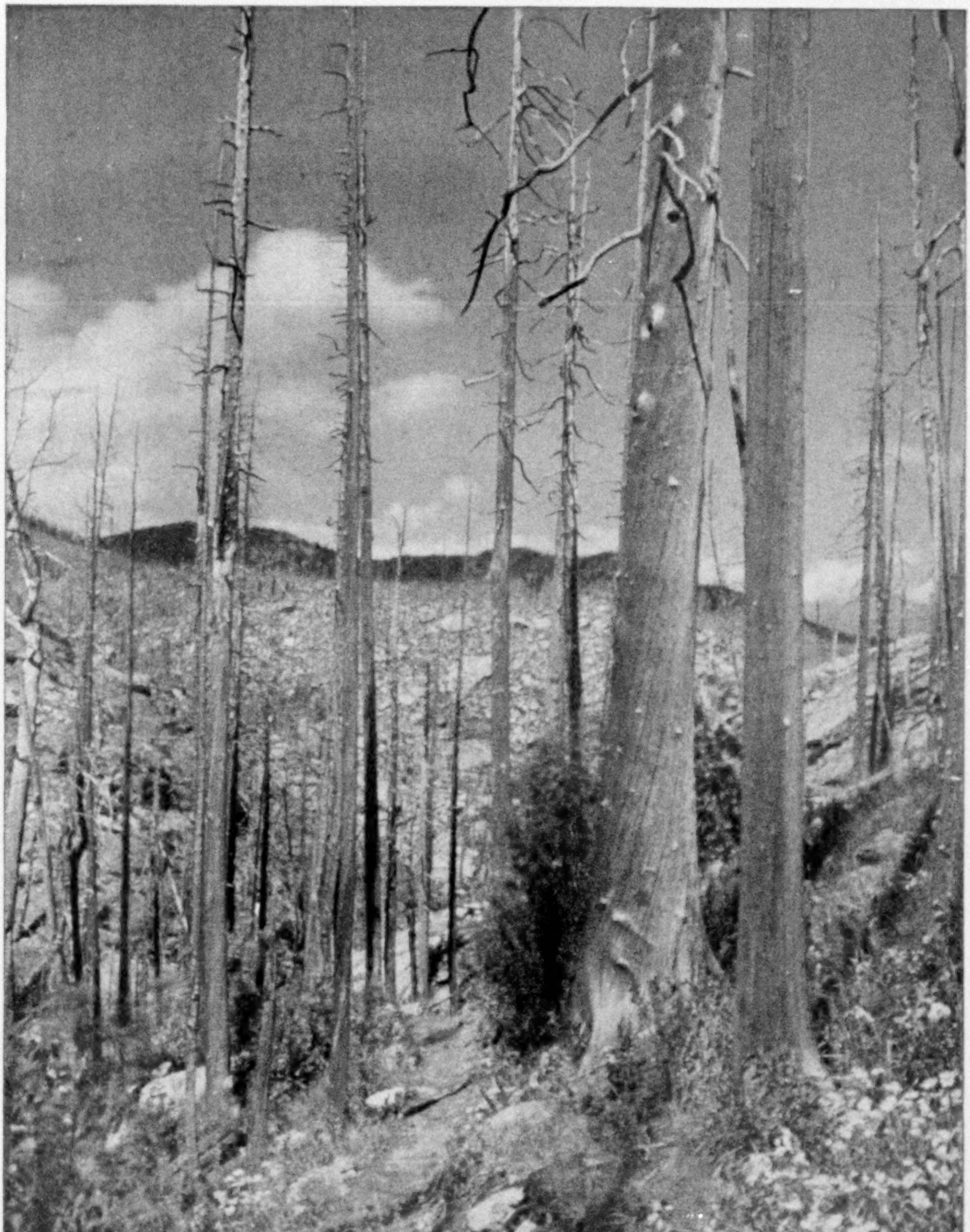
A VISTA OF BLUE AND GREEN AND SHIMMERING WHITE

The deep blue of Fern Lake in Rocky Mountain National Park holds one's gaze until the myriad up-pointing fingers of green carry it to the snowy heights above.



Autochrome © Fred Payne Clatworthy

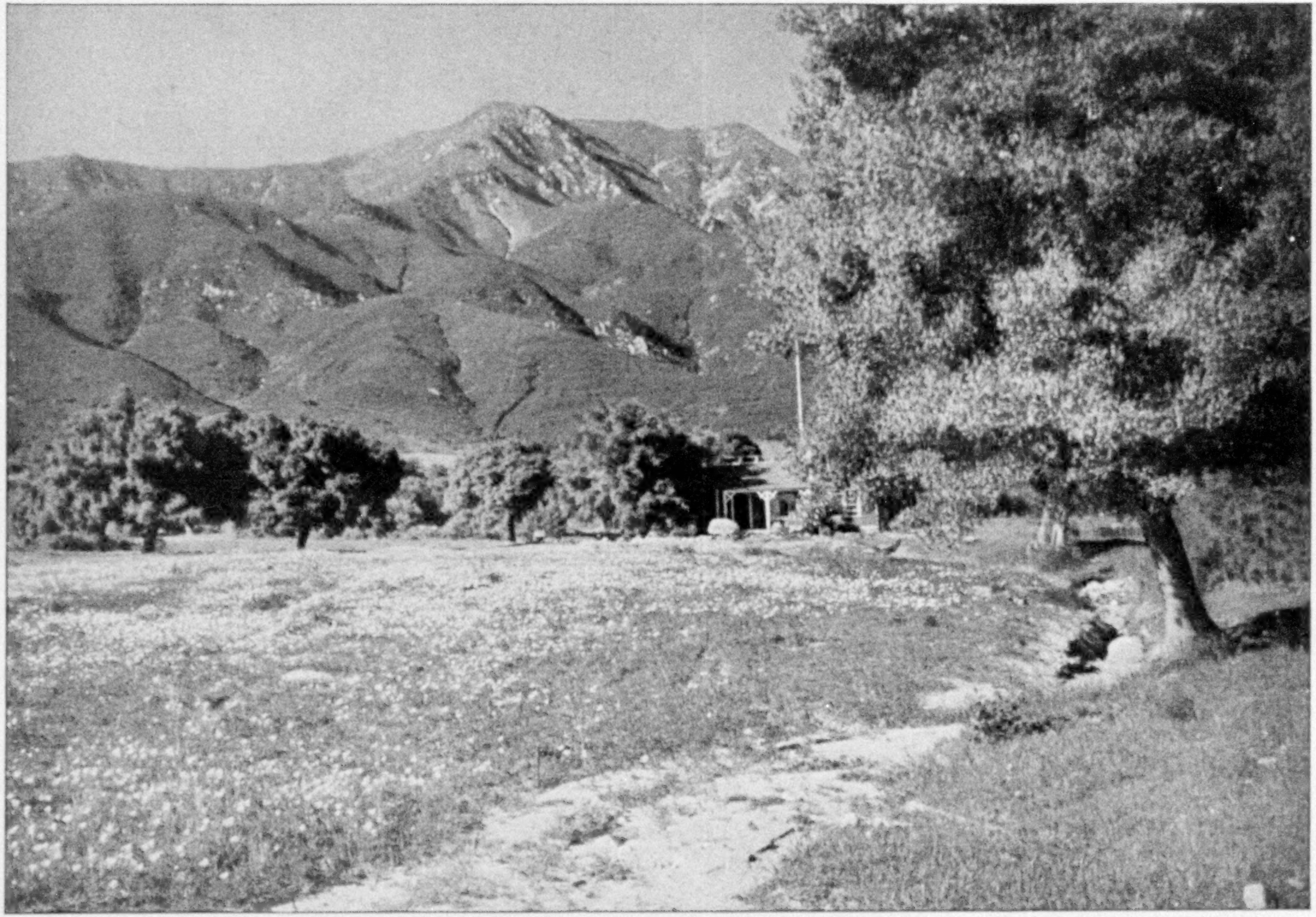
ONCE NOBLE FOREST SENTINELS STILL STAND IN DEATH

The sturdy efforts of wild flowers and undergrowth in Rocky Mountain National Park cannot mask the desolation that has been wrought here, whether by Nature's lightning or the match of a careless camper.

Autochrome © Fred Payne Clatworthy

WHEN WILDERNESS BECOMES A PARADISE

A desert is not always the sea of sand of popular belief. What could be more pleasing to the eye than this view of the verbena-flecked Colorado Desert of California, with snow-capped San Jacinto in the background?



Autochrome © Fred Payne Clatworthy

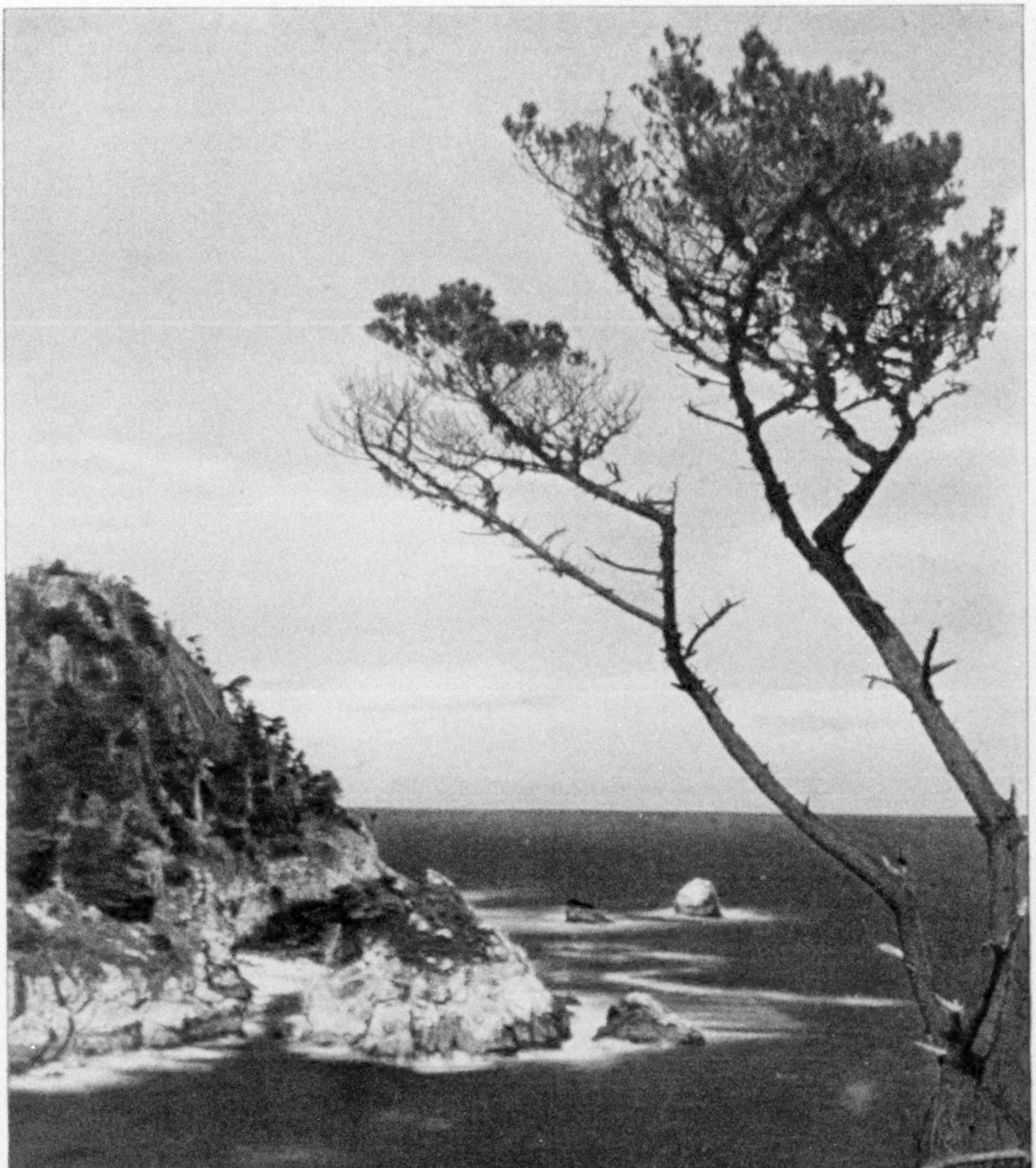
POPPIES BLOW IN OTHER FIELDS THAN FLANDERS

These California mountains give a dominant note to the background; but nothing of harshness can pass the soft, feathery greenness of the trees. And in the meadows which they guard the golden poppies seem to have imprisoned the living sunlight.

Autochrome © Fred Payne Clatworthy

A PATH OF SIFTED SUNBEAMS IN ROCKY MOUNTAIN NATIONAL PARK

Wild flowers of every hue, catching the light rays that filter through the slender aspens, grow in profusion along Wind River Trail.



Autochrome © Fred Payne Clatworthy

BLUE WATERS THAT REACH OFF TOWARD CATHAY

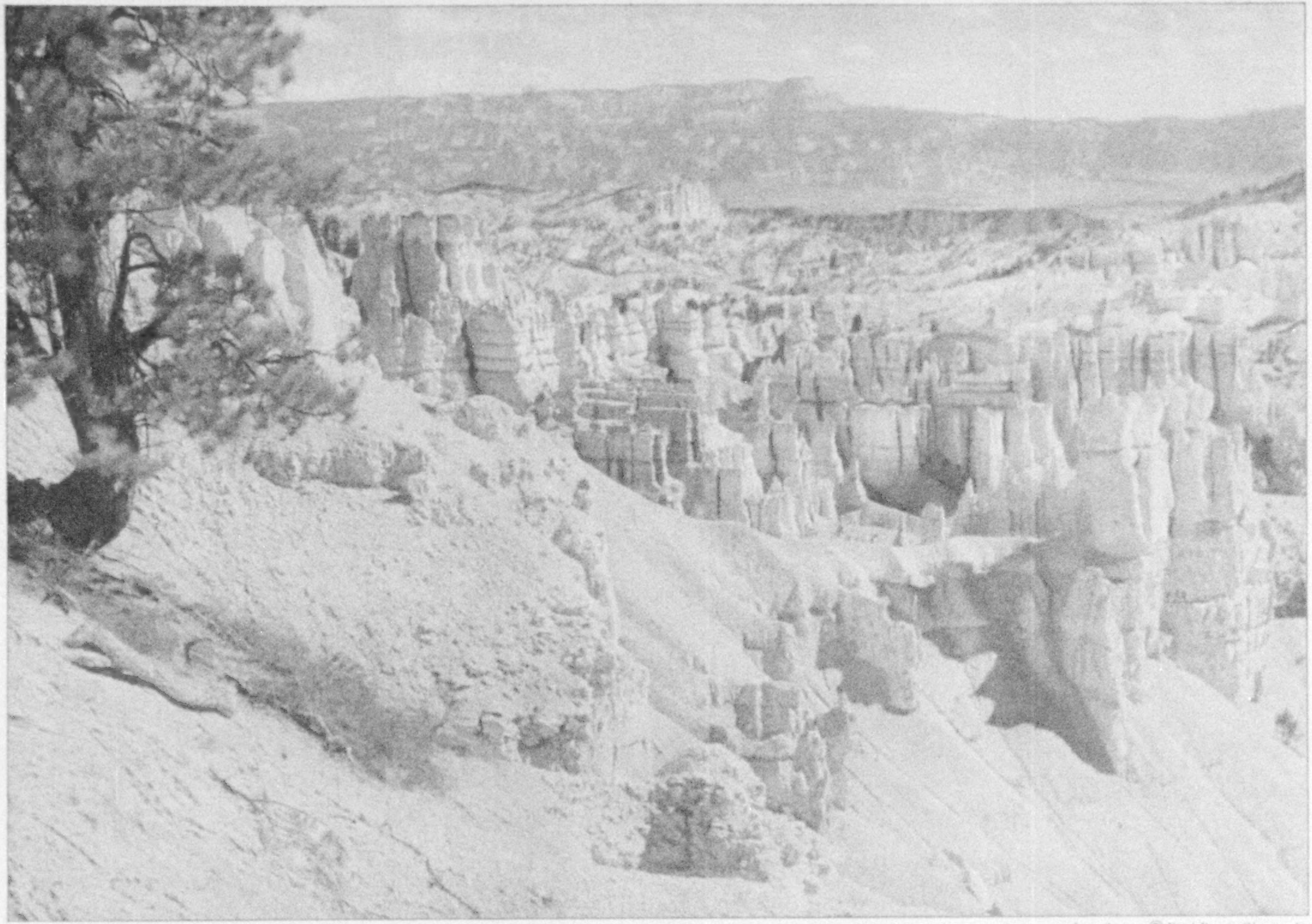
This rocky headland of Carmel Bay, California, is washed by the Pacific in a mood which makes its name most fitting.

Autochrome © Fred Payne Clatworthy

ALMOST TIME FOR THE COTTONWOODS TO DROP THEIR LEAFY ARMS, LEAVING ONLY CONIFERS ON GUARD

Autochrome © Fred Payne Clatworthy

IN SUCH A VALE PAN AND HIS DRYADS MIGHT HAVE DANCED: ROCKY MOUNTAIN NATIONAL PARK



Autochrome © Fred Payne Clatworthy

LIKE THE RUINED TURRETS AND BATTLEMENTS OF SOME ANCIENT CITY: BRYCE CANYON, UTAH

This strikingly eroded and highly colored region is not yet within the limits of a National Park or a National Monument. It has been proposed either to set it aside as a monument or constitute it a State Park.

Autochrome © Fred Payne Clatworthy

SNOWY PEAKS OF THE ROCKIES FROM BEAR LAKE, ROCKY MOUNTAIN NATIONAL PARK

In this magnificent playground of the Nation grassy spaces are rimmed by wooded hills and mountains; placid lakes and trout-filled streams are fed from snow-capped peaks—even glaciers are there. Within the park are excellent roads and trails over which thousands of visitors pass each year.

Autochrome © Fred Payne Clatworthy

MASSIVE CRAGS FORM THE DOORWAY TO THE GARDEN OF THE GODS

As the old Egyptians raised huge pylons to serve as gateways to their sacred temples, so Nature has reared these towering masses of rich red to frame the entrance to one of her regions of weird beauty. Beyond, in striking contrast, the profile of Pikes Peak is drawn in snowy white against a turquoise sky.

Autochrome © Fred Payne Clatworthy

WHERE NATURE'S COLORS AND SHADOWS COLLABORATE TO FORM A WONDERLAND

Zion, situated in the southwestern corner of Utah, is the youngest of our National Parks. Plans are being made for road development between it and the Bryce Canyon area (see Color Plate X). Zion Canyon, shown here, is one of the superlative beauty spots in a region of impressive grandeur.

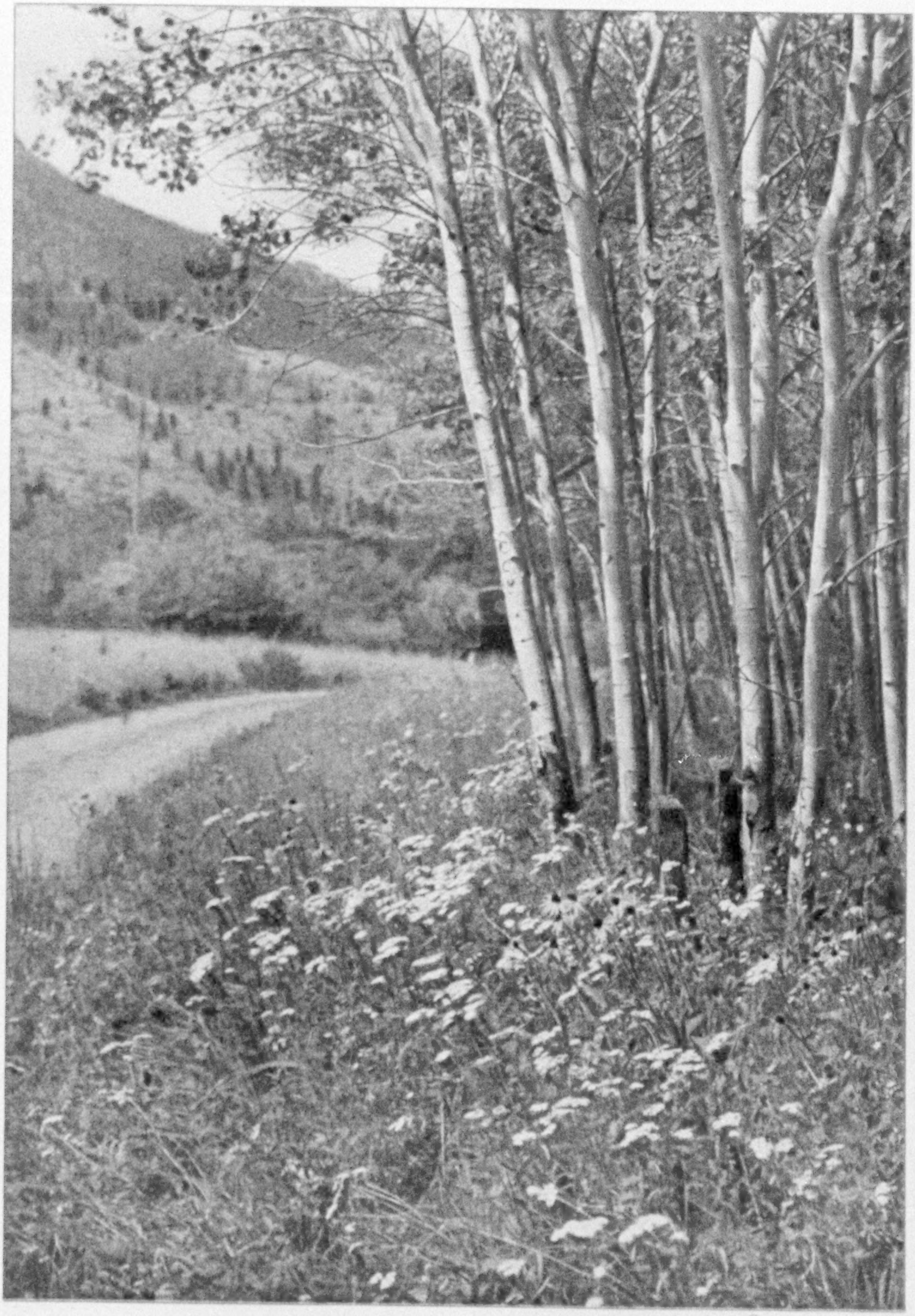
Autochrome © Fred Payne Clatworthy

THE TOM-TOM OF THE NAVAJO ECHOES THROUGH THE GRAND CANYON

It is not the tocsin of war, however, but one of the picturesque trappings of a people who have been led into the paths of peace.



XUM



Autochrome © Fred Payne Clatworthy

A TRANQUIL SUMMER LAND OF TREES AND FLOWERS

These aspens grow in a level, sheltered corner of Rocky Mountain National Park. Within a few miles in almost every direction, snowclad peaks thrust their heads above timberline.

Autochrome © Fred Payne Clatworthy

HARVEST TIME IN THE LAND OF THE BEST

The agricultural seer will see in the distant snow-blanketed mountains fruits of another year growing beside the irrigation canals their melted flakes will feed.

# MISSOURI, MOTHER OF THE WEST


By Frederick Simpich

Author of "The Story of the Ruhr," "Along the Nile, Through Egypt and the Sudan," "The Rise of the New Arab Nation," "The Wends of the Spreewald," etc., in the National Geographic Magazine


IN ALL our Union, no State name is more widely known or taken more in vain than that of Missouri. Even as far away as Hongkong, in the sad silence of a British club, the mere mention of Missouri is sure to provoke at least a cautious, well-guarded British smile.

Once, in just that very place, I was introduced to an Englishman; he was an "old China hand," as white men are called who have lived long on that coast. He had spent his life there, tasting tea. A good "Cha-zee," or tea-taster, he was—a dull, colorless character and as cheerful as a grave-digger. Politely enough, however, when he saw I was an American he mentioned that he had a cousin in Akron, Ohio; possibly I had met him.

"No," I evaded, tactfully, "I'm from Missouri."

"Right O!" he cackled. "From Pike County, too, what?"

Now this man had never seen the States. All he knew of American wit and ways he had picked up from Yankee tea-buyers, traders, and tourists. Yet right away, at the bromidic cue, "I'm from Missouri," he burst out laughing.

Extraordinary! Yet no more inexplicable than that everywhere to-day, in all the English-speaking world, from Manila to Manchester, the Yankee slang phrase "Show me!" is bandied about just as the supposedly incredulous natives of Missouri are said to use it.

Yet these very natives themselves, so good-naturedly jeered by other "Babbitts" in New Jersey and Maine, who are they but the sons and daughters of Virginia and Kentucky pioneers, transplanted and matured now in a new environment, with a mid-west culture peculiarly their own!

### PROVINCIAL, YET POWERFUL

And as to Missouri itself—let us examine this vast rich Commonwealth that has become the butt of a national joke. In all the Union no State has had a more picturesque history; and few, certainly not more than four or five out of the whole 48, contribute more to the Nation's wealth, strength, and daily bread.

To-day, provincial yet powerful, the variegated resources of an empire within her wide borders, tolerant, indifferent—maybe a little ignorant of the notoriety that is hers in the outside world—what kind of a place is it, anyway, the mere mention of whose name makes men smile, even over in China?

Before we talk of the Missouri folk themselves—of their life, work and play—let us look hastily at the region they live in and the peculiar part it has played in the drama of the West.

From the first days of French and Spanish exploration, and the settlement of white fur-traders at Ste. Genevieve and St. Louis, the colonization and development of Missouri has had a far-reaching influence on the American West.

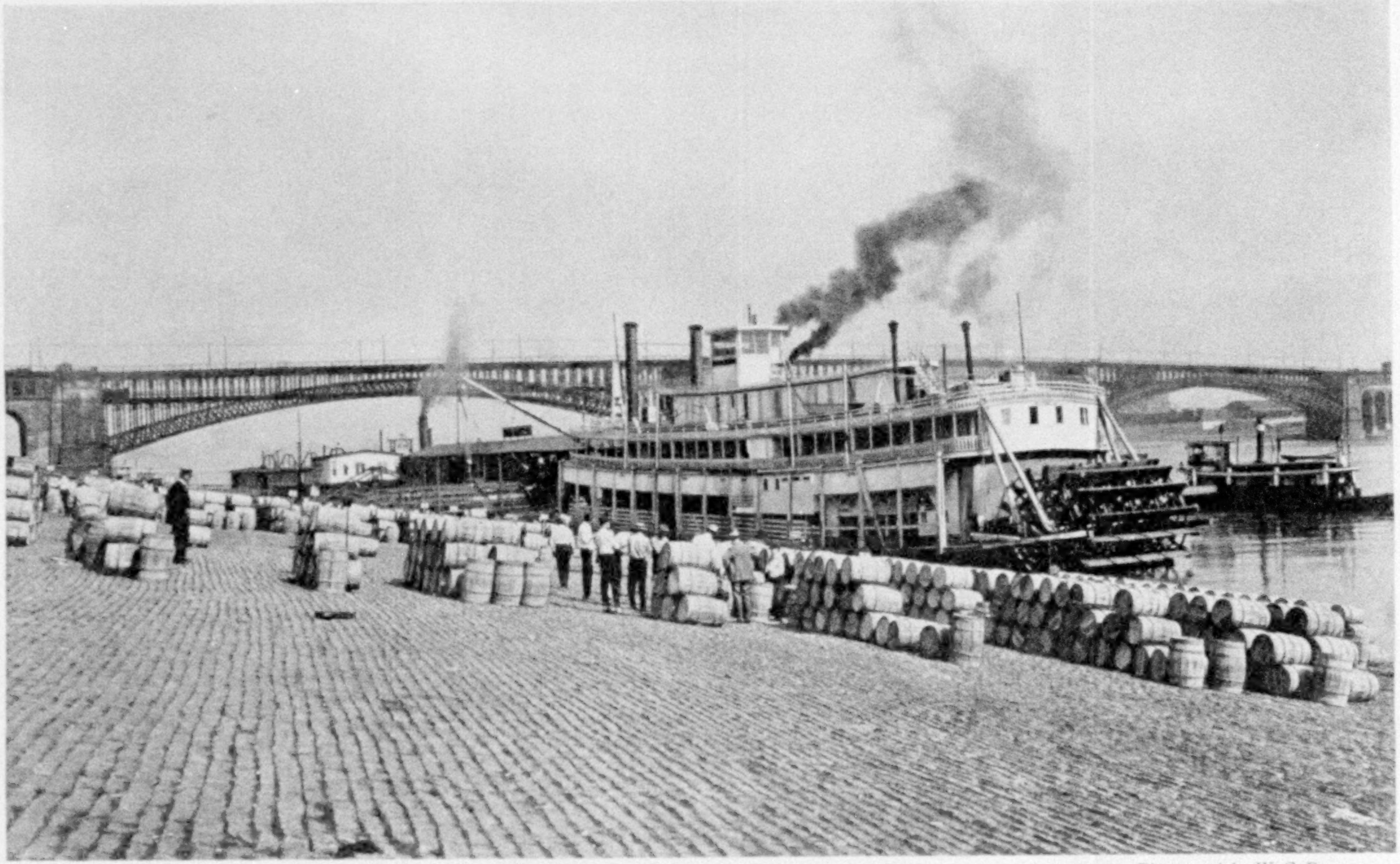
### A MAN-POWER RESERVOIR FOR OTHER STATES

From the original Missouri Territory twelve other States were carved, and from the wild lands farther west eight more were formed. From Missouri, in great numbers, early pioneers went out to settle these new States—to become their governors, judges, and congressmen.

When Texas fought for independence, an army of men from along the Big Muddy, in coonskin caps and buckskin breeches, rallied to the Lone Star banner, and later tens of thousands swarmed down and helped settle that enormous State.

Long before Chicago was even a town, Missouri pioneers were plodding over the Santa Fé Trail, fighting Indians as they went, to trade with distant Mexico.

Situated as it is, on two great rivers and midway between North and South, Missouri—from the days of Lewis and Clark, of Pike, Doniphan, and Frémont, down to the transcontinental flivver tourist of 1923—has been the great natural gateway to the West.



Photograph by W. C. Persons

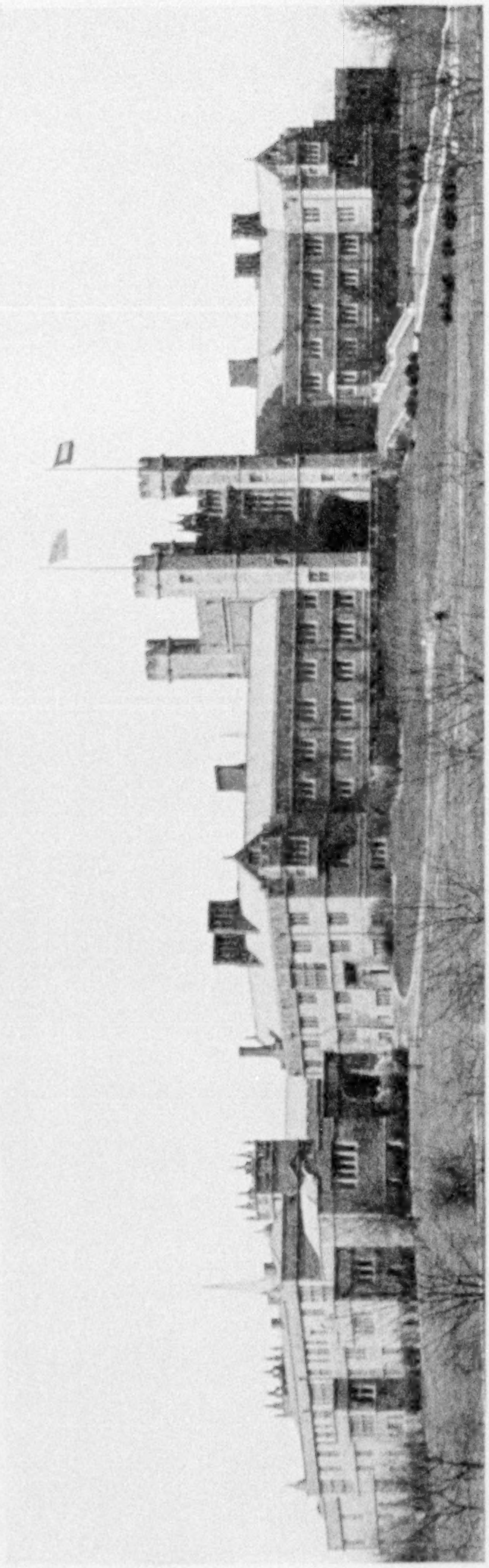
A SMALL SHIPMENT OF MISSOURI APPLES ON THE ST. LOUIS WATERFRONT

The tall-stacked "palatial" steamboats of Mark Twain's day have vanished, but a modern river boat or barge tow can move 10,000 tons of freight. Probably one-half of the export commerce of the United States originates in the Mississippi Valley.

Photograph from Frederick Simpich

MISSOURI MELONS MELT IN YOUR MOUTH

In view of such lusciousness, one can readily understand why Missouri's farm products in a recent year sold for $940,000,000 (see page 429).



Photograph by W. C. Persons

THE ALMA MATER OF MANY A MISSOURIAN: MAIN BUILDINGS OF WASHINGTON UNIVERSITY, ST. LOUIS

Washington University was first chartered, in 1853, as Eliot Seminary, in honor of the Reverend William G. Eliot. The name of the institution was later changed to Washington Institute, at Mr. Eliot's request. The opening of an evening school for boys was the first educational work inaugurated under its charter. Only 3 per cent of the people of Missouri are illiterate (see text, page 457).

In all the history of the migrations of men and tribes from one part of the earth to another, there are few routes which have been traveled by as many people as this famous emigrant path across Missouri. Since Indian times, since the days of '49, since the day when the golden spike was driven that opened the first transcontinental railway, literally millions and millions of people have poured through Missouri, going west.

### MEMORIES OF WESTWARD-TREKKING PRAIRIE SCHOONERS

To-day, following the historic Santa Fé Trail, a great transcontinental motor highway crosses the State. As a child, I saw, on this same old trail, an endless stream of "mover wagons," canvas-topped prairie schooners, laden with household goods, women and children, trekking west to the new, cheap lands.

Behind each wagon followed dogs, cows, and mules with bells on, or small, tired boys riding the extra horse. At night the emigrants camped near wood and water, maybe resting a day or so at some favorable spot to swap yarns or horses, to shoe a mule, or soak the wagon wheels in a friendly pond to swell the wooden rims and keep the tires from falling off — an earlier form of tire trouble!

Sometimes, on a dirty canvas wagon-top was painted the defiant legend, "Kansas or bust." One wagon, maybe too timid for the test, returned from the west, blazoning the explanation, "Busted! Going back to my wife's people."

Even as I write these lines, that procession is still moving through Missouri, by rail and

by motor, pressing westward without pause, rushing over good land in quest of better—the eternal lure of distant places.

If you merely rush through Missouri by train or motor, you see little of its fields, forests, or country towns to distinguish it from Virginia or Indiana, for example. With the near-by Kansas plains or the prairie flats of Illinois, its wooded hills and winding streams, of course, form a pleasant contrast.

But to know the real Missourian, to appreciate what pioneer environment or cultural influence may have served, in the past, at least, to make him a marked man in other States of the Union, you must quit the larger cities and seek him on his native heath.

### FEW FOREIGNERS IN MISSOURI COUNTRY TOWNS

Visit in any Missouri country town and, if you are a keen observer, you will be struck by the almost total absence of foreigners. No Greeks running cafés, fruit-stands, or shoe-shining "parlors"; no swarthy Neapolitans or blue-eyed blondes from the North Sea countries. Here, after more than 200 years of white colonization, there is developed a remarkably pure "American" type.

Even after allowing for the large foreign elements in the cities, nearly 95 per cent of all Missouri's people are native-born Americans, and more than 75 per cent are native-born Missourians. To-day some old families, tranquil, permanent, and content, are living on the same farms that their ancestors "took up" when they came pioneering with squirrel rifles and spinning-wheels, more than a hundred years ago.

Here, too, is the tenant farmer—an itinerant agriculturist who owns his own animals and implements, but works the landlord's farm, usually for a share of the crop. Of the 277,244 farms in the State, more than 150,000 are worked wholly or in part by tenants. Some few of these are peculiarly restless folk, gipsy-like in their life of change. In some of the more backward regions the country roads, on the first of March in every year, reveal numerous families on the move, their household goods piled high on farm wagons, as they trek off to new homes.

One quaint story relates that a certain tenant had moved so often that every spring when he backed his wagon up to the kitchen door to load the stove, all his chickens would gather around, lie down, and obediently hold up their feet to be tied!

### MISSOURI SIGNS AND SUPERSTITIONS

Incidentally, daily life among this small element is still seriously swayed by signs and superstitions.

These Missourians will not kill hogs or plant potatoes except in the right "light of the moon."

If a thunderstorm comes up, all dogs are promptly kicked out of the house, because "their tails draw lightning."

If the "thunder-pump" bird is heard calling at daybreak, or if a snake killed in the morning turns belly-up in dying, it is sure to rain before night.

If a bird flies into the house, it means a death in the family, and a lone dog howling mournfully at night bodes no good to those who live near.

Crowing hens are killed at once, for they, too, bring bad luck, and it is a sad man indeed who breaks a mirror or kills a cat, for seven years' misfortune is likely to follow.

If a housewife drops a dishcloth, it means that company will come before night; and freckled girls may gain clear, white complexions by arising before sun-up on May Day and bathing their faces with dew.

A cow that has "lost her cud" may be salvaged if fed in time on the right kind of a rag.

If a man lies abed, ill with fever, feathers plucked from a black hen and burnt in a pan under the bed will drive away the disease.

A fighting, fiddling, horse-trading lot they are—a curious, disappearing type—yet not typical at all, for many tenants operate on a big scale, and still other farms are run by tenants of the farm-manager class—substantial, capable, and prosperous. Yet there are now and there have been just enough of these happy-go-lucky, itinerant people to form a distinct social unit; and, nomadic as they are, many of these in migrations to Texas, Oklahoma, or Oregon have, by their

Photograph from University of Missouri

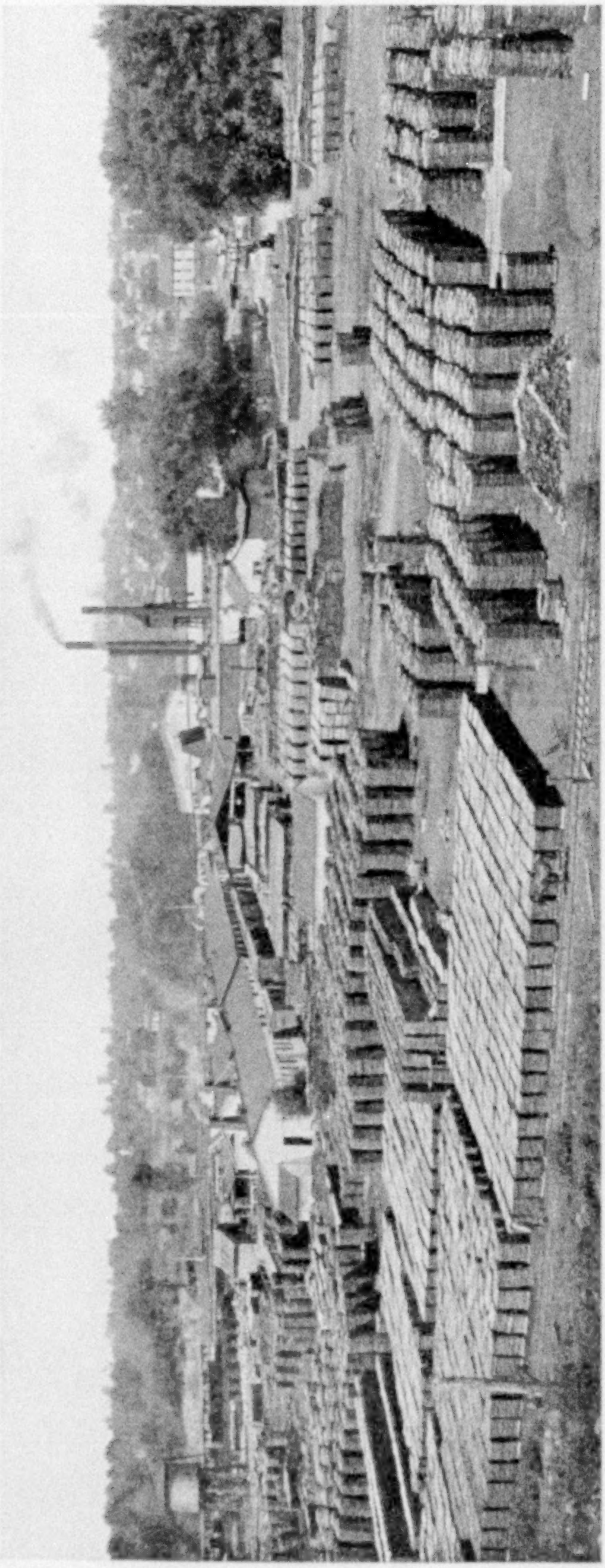
A CLASS IN BEEKEEPING, MISSOURI COLLEGE OF AGRICULTURE: COLUMBIA

The young Missouri farmers of this generation realize how much better they are prepared to handle their problems after they have gleaned in agricultural colleges the facts which their predecessors had to learn through experience.

Photograph from University of Missouri

MISSOURI IS GIVING DISABLED VETERANS A CHANCE TO HOE THEIR OWN ROWS AGAIN

Disabled soldiers, taking vocational training at the Missouri College of Agriculture, are learning improved methods of farming and of packing their produce for market. The State has made rapid strides in the educational field in recent years; it now has 14 public seats of learning belonging to the college union and 17 junior colleges (see text, page 457).



Photograph from Frederick Simpich

A STAVE FACTORY AT POPLAR BLUFF, MISSOURI

Missouri stands first in manufacturing among the States west of the Mississippi. The wood for these staves comes from her own forests, rich in walnut, ash, hickory, oak, pine, maple, elm, sycamore, gums, and cypress. More than a third of the State is woodland.

peculiarities, at least done little to dispel the illusion that Missourians are a bit "different."

Though a phenomenon not peculiar to this State, it is still easy enough, in "placing" a man, geographically, by tricks of speech, to identify the born Missourian. If a man says he feels "poorly," or that grandma is looking "mighty peart," or that little Jimmie has become quite "a chunk of a boy," or has acquired a "right smart" learning, he shows you where he's from.

### THE GENTLEMAN FARMER CHANGES HIS WAYS

In striking contrast is the great body of middle-class rural Missourians, who own their own farms and supervise their own farm laborers. But even in this powerful and prosperous group amazing changes have come in the past few years.

Not so long ago, in this leisurely comfortable class, the gentleman farmer rode over his estate on horseback two or three times a week to see that the negroes and white "hired men" were duly at work. Then he had time to go squirrel-hunting or fox-hunting or play a little poker. All he knew of his calling then he had inherited from his father, gleaned from the experience of his neighbors, or read in some farm journal.

To-day the schools and universities and labor unrest have changed all this. On any big Mis-

souri farm now you will likely find a young landlord, graduated from the State "ag" school, clad in overalls and on the job himself.

He is up at dawn, to see that the gas has come for use in the new tractor; he is out at the great barn, illuminated with its own lighting plant, to see that the milking is being done promptly, or that the prize bulls are being clipped and manicured for exhibit at the State fair, or he is busy vaccinating hogs against a threatened cholera epidemic, or up and away to hear a lecture by the county farm adviser on how to mix a spray and treat the apple trees, to drive off the codling moth.

### A STATE THAT HAS AIDED ITS COUNTRY FOLK

No State in the Union has done more to raise the level of intelligence among its country folk, to make their work easier and more profitable, than has Missouri.

The State University runs an experiment station and more than half the counties employ agricultural agents, who act jointly for the College of Agriculture and the County Farm Bureau. These farm experts are busy with various programs of rural development, including animal husbandry, horticulture, entomology, farm management, veterinary science, and home economics.

From the university, also, free circulars are distributed, telling in simple language how best to solve the many problems on a farm.

Then, by the school's extension service, groups of boys and girls from ten to eighteen years old are organized into clubs, which are encouraged to compete for prizes in raising the biggest ears of corn, the fattest calves, or the finest-looking chickens.

In no other State are farmers so largely engaged in the live stock industry. There are other contests—in sewing, canning, baking, etc.—wherein the girls compete, one group with another.

In other words, the State now seeks to teach to the farmer's children what the farmer himself acquired only after years of costly experience.

To get a better picture of the self-satisfied people in this big, rich State, it may help you to consider some of the curious contrasts it offers.

More than 30 railroads run into it, centering at St. Louis and Kansas City, yet many of its counties, in some of which the population is less than 10 per square mile, have no railroad at all. In one region, at least, farmers haul their produce 25 miles to reach a market, at a cost higher than the freight charge for shipping the crop from St. Louis to Europe!

This diversified land of plenty is more nearly self-supporting than any other State in the Union. In one peak-price year it sold $940,000,000 worth of farm products, and some of the finest stock farms and the largest cornfields in America are in northern Missouri.

Yet down in the Ozarks, due to lack of transport, it is said that more than 13,000,000 acres of cut-over lands—potential farm homes for thousands of families—are lying idle.

Lately, however, to "lift Missouri out of the mud," a $60,000,000 bond issue has been voted, to build 6,000 miles of roads where, in some counties, the roads are now little more than tracks in the dirt.

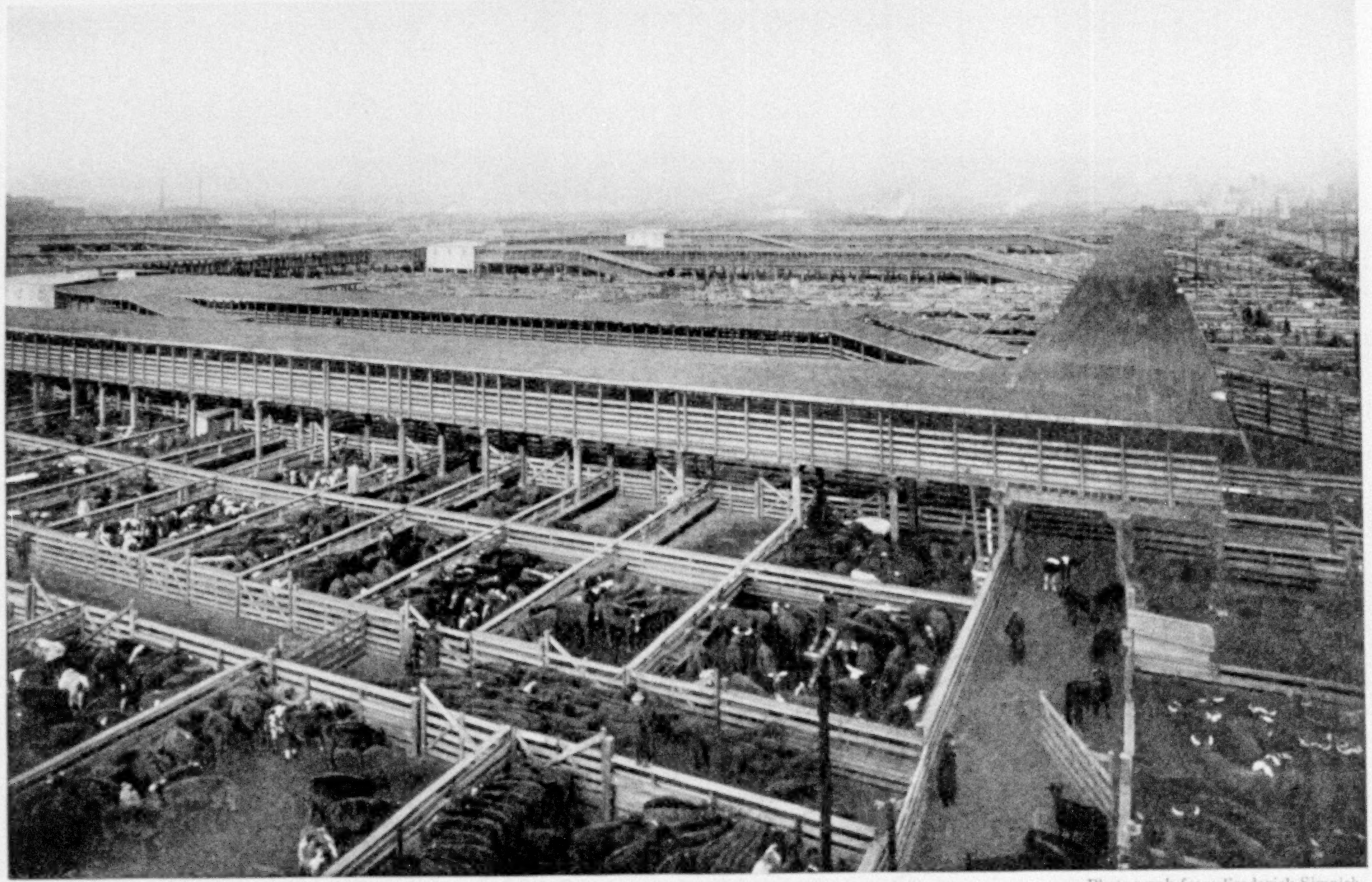
From the farms in central and northern Missouri high-class breeding animals are shipped every year to Mexico, Europe, and South America and sold at amazing prices. Yet down in the south the razorback hog, subsisting on acorns and roots and running wild, as wild almost as the javelinas or peccaries of Sonora, is one of the curiosities of the countryside.

They tell of one farmer who used to call his pigs by knocking his pipe against the gate-post. A newcomer bought his place and fenced the razorbacks in a heavily wooded lot. Here the misguided swine, hearing the woodpeckers hammering all day long and mistaking the sound for their master's call, ran themselves to death looking for him!

### COUNTRY FOLK DRIFTING TO THE CITY

To a startling degree the experience of Missouri between 1910 and 1920 shows the extent of the drift of country people to the cities. Nearly every county in the State lost population. The total gain of the whole State, which now shelters 3,404,055 people, was only 3.4 per cent, as against 50 per cent in Arizona.

To the student of farm economics, however, it is interesting to observe that, in spite of this movement away from the



Photograph from Frederick Simpich

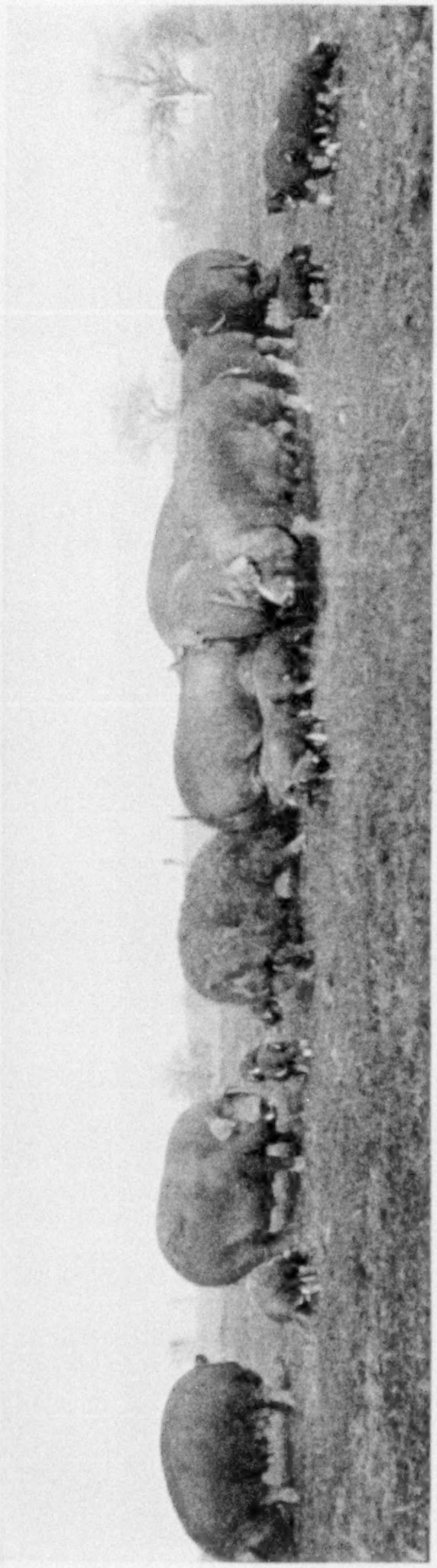
A SECTION OF THE KANSAS CITY STOCKYARDS

In one year 8,000,000 head of live stock passed through this city, many of them destined to play their part in feeding war-stricken Europe.

Photograph by Eugene J. Hall

THE MISSOURI MULE HAS EFFECTIVELY KICKED HIS WAY INTO HISTORY, SONG, AND STORY

Concede Napoleon's aphorism that an army travels on its stomach, but the field artillery wing moves by virtue of the Missouri mule, whose sterling qualities are no less universally recognized than his cantankerous disposition.



Photograph from Frederick Simpich

MISSOURI PORKERS

Missourians assert that more honors in the show ring have been won by live stock of their State than the exhibits from any other State in the Union.

farms, farming itself is more efficient and profitable.

Corn is the chief crop. In 1920 nearly 212,000,000 bushels were grown, a per-acre yield of 32 bushels, which exceeded the previous ten-year average by almost 25 per cent. Incidentally, there are fewer farms now than ten years ago, because of increase in farm investments and the consolidation of farms into larger units.

### THE AGRICULTURAL CENTER OF THE UNION

Midway between Canada and the Gulf, midway between the two oceans, Missouri, as the agricultural center of the Union, occupies a most strategic position in relation to transport means and markets. More than half its boundary, or about 850 miles, is waterfront. The Mississippi winds for 560 miles along its eastern edge; the Missouri flows for 208 miles through it, and the Des Moines in the northeast and the St. Francis in the southeast give it another 100 miles of river front. It enjoys more miles of navigable rivers than any other State, and a large share of the railway traffic from the Atlantic to the Pacific passes through it.

Going in from the east, you usually enter Missouri at St. Louis, over one of the four great bridges that span the Mississippi there. And, as the history of Paris is the history of France, so the story of St. Louis, in the beginning, was the story of Missouri.

### ST. LOUIS' WATERFRONT IS FORBIDDING

When the pioneer Americans went west, floating down the Mississippi, their first destination was that early French fur-traders' colony called St. Louis.

But if La Salle came back to-day, and came again by water, he'd probably never land at St. Louis; he'd hurry on to a prettier, cleaner place. Maybe in 1682, when this first white man landed, he found here a beautiful beach of clean white sand, leading back to grassy slopes lined with stately elms and walnuts or giant sycamores—a lush, verdant land, its pure air filled with the songs of wild birds.

As late as Dickens' time this river front, this old "French Quarter" mentioned in his "American Notes," was not without

color, music, and poetry. It was vibrant and restless with the gay, gallant life of that tumultuous ante-bellum epoch.

But unspeakably desolate it is now, and depressing. Though St. Louis first drew her very life from the great river, to-day she has turned her back on it—and a shabby, weatherbeaten, forlorn old back it is!

The 19 miles of waterfront, which might be parked—all grassy lawns and flower beds, with groves of shrubs and shade trees, as charming as New York's famous Riverside Drive or the restful roads that Washington has thrown along the Potomac—form in sad truth probably the ugliest river front in all America.

The majestic river, the greatest on our continent, is actually shut off from view, invisible to the real St. Louis, by the old, dilapidated buildings that fringe it.

### A DISHEARTENING VIEW FOR THE VISITOR

Even entering the town by rail over any of its 23 roads (22 of which enter the Union Station), your train seems to go reluctantly, grumbling, as if sensing its mean surroundings. In uncomfortable intimacy you fairly hug the back doors of endless squalid two-story brick houses, through whose uncurtained windows you glimpse the inner chambers of cheaply furnished homes, of crowded, unkempt flats where beds, sewing-machines, and dining-tables seem struggling for standing room.

Across narrow courts lines are stretched, from which the family wash hangs wet and limp or pops in the wind like the myriad flags that dress a ship on gala days.

On and on your train winds, twists, and squeaks, now passing grimy warehouses, abandoned livery and feed stables, breweries that cannot brew, on past gloomy coffin shops, past breakfast-food factories flinging giant signs to a startled world, and yet farther along, over the elevated road, above rough, cobblestoned streets noisy with jolting trucks.

Thus you proceed by jerks, jumps, and dusty, stifling waits, till you climb out under the vast, dirty, vaulted roof of a smoky, sooty Union Station. Grimy and worn it is, like some ancient temple in a holy city of India, crowded with listless men, with tired women and crying babies, and bundles, bundles, bundles.

For 25 years I, too, have gone in and out of that station; yet always that listless, forlorn army is waiting there, waiting for the day coaches to back in, so it can go home to Moberly, or Joplin, or Sedalia; to go home, so it can rest up, save money, and bring more babies back to St. Louis, to spend its money there and wait again for the day coaches to back in, to ride home again.

From this dark, cavernous maelstrom of men and women, of din and mingled odors, more narrow, cobbly streets lead off, jammed with clanging street-cars, bouncing motors, and jolting trucks—lead off to Olive Street, to Delmar, to King's Highway, to the greater, better, real St. Louis, the mightiest city west of the Mississippi.

Like Bagdad or some old inland towns of Europe, St. Louis, though she never smelt salt water, is the home of world traders, of men who traffic over the seas.

Long ago St. Louis outgrew Missouri—even the Mississippi Valley.

Unique among western cities, St. Louis, with a population of some 800,000, has never enjoyed or suffered a boom. An indefinable air of permanence, of mellow age and ripe judgment, a stability like that of Antwerp or Copenhagen, is the spirit of the place—old, respectable, sure of her position. In 44 years her city limits have not increased.

Though often called a "German" city, the total of foreign-born in St. Louis is only 13 per cent, as against 32 per cent in Boston, which "looks down" on St. Louis, and 35 per cent in New York.

### ALWAYS A CONSERVATIVE CITY

It has never been a town of get-rich-quick schemes, or "wild-cat" oil and land sharks; rather is there something of the conservative Liverpool or Manchester merchant in the deliberate planning of its traders.

In reviving river traffic, tying St. Louis up by water with the ports of the world, these traders are looking ahead, not a year, or two, but ten, twenty, fifty years. So it is in their far-seeing plans to move some of the steel trade west, to St. Louis or its vicinity, where coal and iron ore meet.

Photograph from Frederick Simpich

GRADING WOLF SKINS IN ONE OF THE LARGE FUR WAREHOUSES OF ST. LOUIS

St. Louis has taken the palm from Leipzig and Nizhni Novgorod as the world's greatest fur-trade center. Raw furs come to its markets from the ends of the earth (see text, page 449).

It has been said that great cities grow from basic causes; that they do not develop by chance, nor can they be artificially created.

GEOGRAPHY MADE ST. LOUIS A MANUFACTURING CENTER

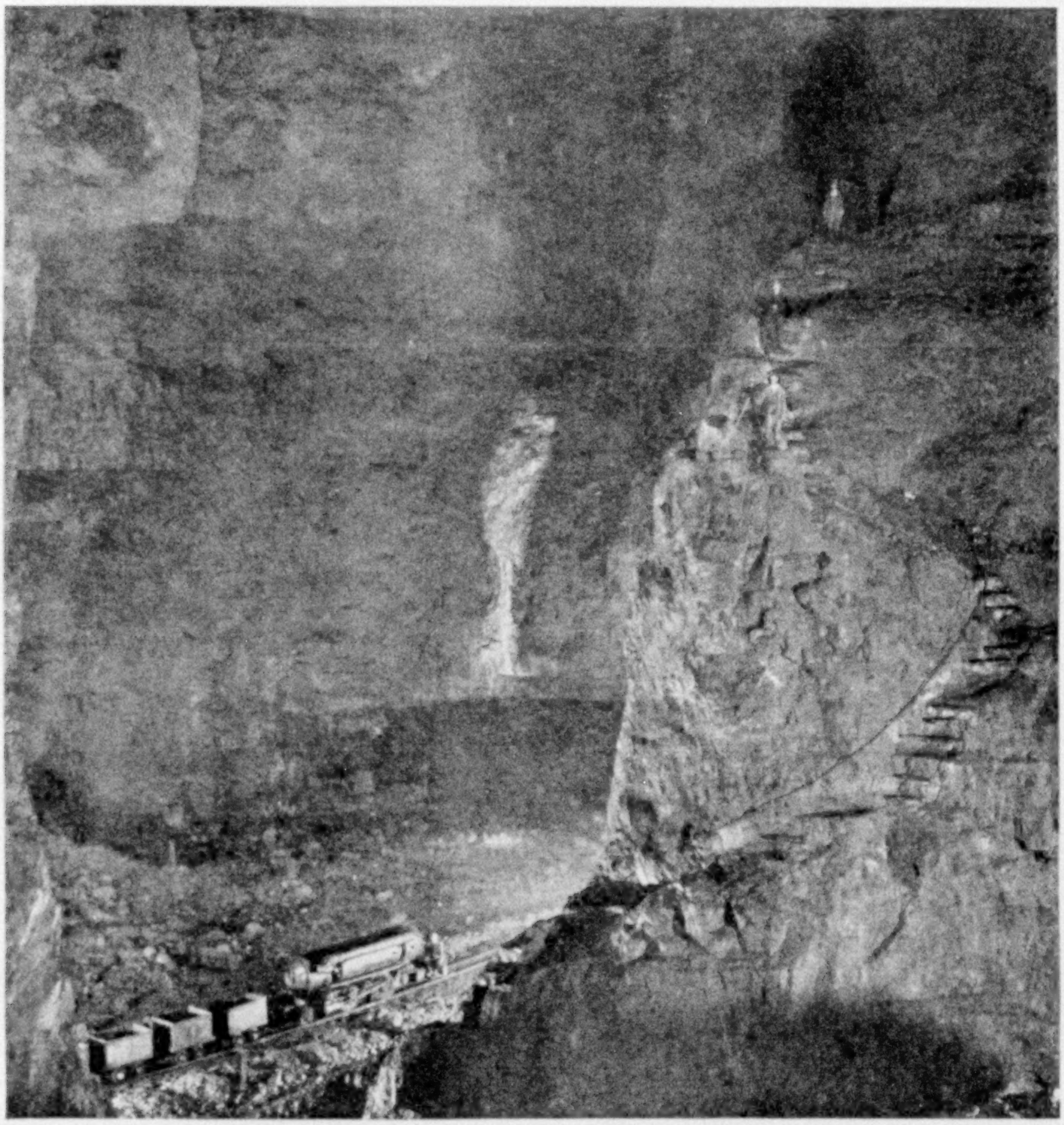
Ever since the Pilgrims put their baggage ashore and walked inland a little ways, looking for good sites on which to build homes, American progress has been toward the west.

Nowhere is geography a greater factor for success than in manufacturing. As geography answers the question "Where?", so the manufacturer wants to know *where* he is to find fuel, raw materials, labor, and a market for his products.

The rise of Missouri as the greatest manufacturing State west of the Mississippi is due to these facts: she has abundant raw materials, plenty of coal, honest American labor, and easy transport by rail and water. At St. Louis 23 railroads terminate, representing 80,000 miles of track.

It is because the population center moves westward and the extra millions must be fed that Missouri has become great.

The East is dotted with big and little shops that must bring their raw materials



Photograph by Thompson's Studio

HIGH GROUND IN THE LEAD MINES AT BONNE TERRE, MISSOURI

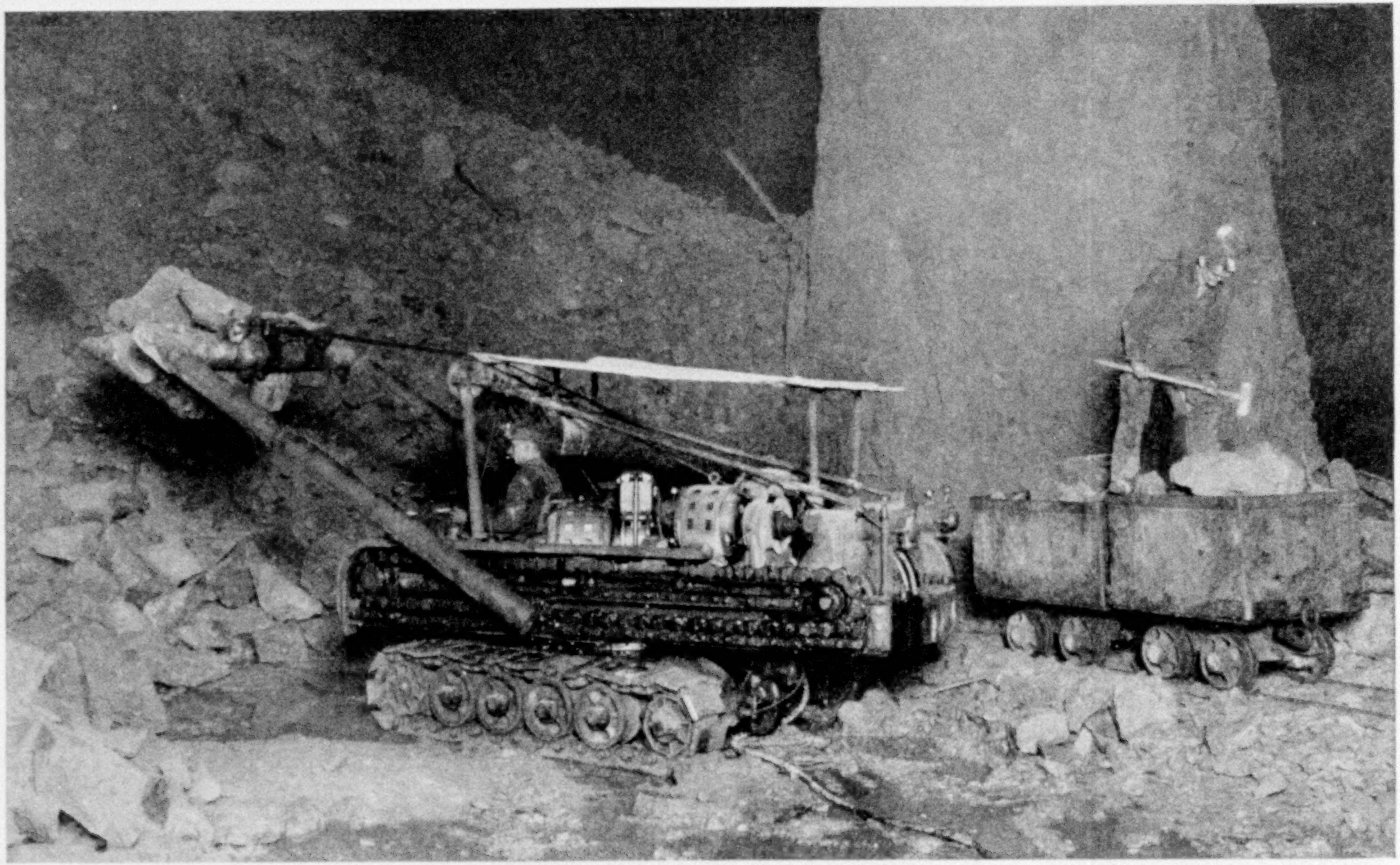
The steps pinned into the solid rock up the steep bluffs serve as a safe roadway for the workmen going to and from the working face. This stope is 185 feet high, the roof being supported by massive pillars of rock.

all the way from the Middle West, and then ship the finished product back there again to find a market. The workers in these shops, too, must be fed and clothed with goods shipped all the way from the West.

Originally, these myriad shops and factories were built in the East because there population was most dense and trade most brisk. But the westward tide has changed all this. Not counting heavier and more bulky goods, 1,200 cars of "package freight" leave St. Louis every night.

Thanks to Uncle Sam's help in improving the Mississippi, St. Louis now is virtually a seaport for export shipments. Barges can haul out a million tons annually (see page 450).

Standing on the great municipal docks, you will see men unloading coffee from Brazil, sisal from Yucatan, mahogany from Central America, sulphate of ammonia from Japan, potash from Germany, fruit from Costa Rica, etc., and perhaps loading tank plates for the oil fields of Persia or the Dutch Indies, iron



Photograph by Thompson's Studio

AN ELECTRICALLY DRIVEN SHOVEL IN A MISSOURI LEAD MINE

Missouri mines more zinc and lead than any other State in the Union, the output representing from 40 to 45 per cent of the total amount produced in the United States.

pipe, shoes, stoves, motor cars, wire, rope, grain and meat products.

One-twentieth of all the world's coal is dug within 100 miles of St. Louis. Fuel oil is piped from the vast mid-continent fields, and from the great Mississippi dam at Keokuk comes cheap electric power.

Probably 50 per cent of all our export commerce originates in the Mississippi Valley, and St. Louis exporters enjoy a peculiar geographic proximity to Central and South America, to Mexico and the West Indies.

Connected with the Gulf by many rail routes, as well as by the open river, St. Louis trade is seldom seriously affected by congestion or tie-ups on the North Atlantic seaboard.

WHERE THE "LARGEST IN THE WORLD" OFTEN APPLIES

From this vast Mississippi Valley come some 70 per cent of the farm products of the whole United States, 75 per cent of our lumber and forest products, 70 per cent of all our oil, and 60 per cent of our mineral products. And St. Louis lies closer to the center of our farming industry than any other great city.

Much as sensitive Americans may shrink from that blatant Yankee phrase, "the largest in the world," to get a true picture of the giant commercial strength of St. Louis it must be set down that no other city on earth produces or sells so many boots and shoes, raw furs, stoves and ranges, horses and mules, or so much sugar-mill machinery, woodenware, steel furnaces, hardwood and pine.

The largest shops on earth devoted to making drugs, bricks, street-cars, macaroni, plug tobacco, and terra cotta wares are in St. Louis; and no other town in America deals on so great a scale in millinery, hats, coffins, bags, trunks, hides, chemicals, saddles and harness, carpets, and sashes and doors. It probably leads all other American cities in the diversity of its industries.

They say one man in every five in the whole United States walks in a pair of shoes made in St. Louis, and St. Louis has built and shipped street-cars to every nation where street-cars are used.

The tall-stacked, "palatial" steamboats of Mark Twain's day, with their long, musical blasts, their black banjo-playing, barefooted deck hands, their ornately gilded "saloons," gentlemanly gamblers, and aristocratic passengers drawn from the plantations along the river, have passed away. At their best, these stern-wheel packets carried no great amount of cargo compared with the giant freighters of to-day. A modern river boat, or barge tow, can move 10,000 tons of goods, or more than 350 carloads—as much as ten trains—in a single tow.

It is said that when King Albert of Belgium was asked what he most wished to see while at St. Louis he said: "A refrigerating plant and the Mississippi River." A visiting Japanese asked to see "A St. Louis school building—and the river." A group of Scandinavians said, "Only the Mississippi."

Always, in Missouri and everywhere, it is the great river. Mark Twain's "Life on the Mississippi" was the only book I found on a British boat plying up the Tigris from Basra to Bagdad. How much the world learned of Missouri and this river from Tom Sawyer!

Here and there an old house still stands, to remind this new generation of soda-water drinkers of the days that are gone.

Here is the old stone courthouse, from whose steps slaves were sold at auction in ante-bellum days; on its east steps stood the city's public whipping-post. In Churchill's novel, "The Crisis," it is mentioned as an early landmark.

GRANT'S CABIN IS SURROUNDED BY FENCE OF RIFLE BARRELS

Grant's cabin, the log house in which he lived during those hard years when he peddled wood in St. Louis, still exists. Moved from its original site, it is now set up, each log in place, on the country estate of a wealthy St. Louisan. Inside the cabin are many relics intimately connected with the man who, as has been said, could fight better than he could farm.

An odd fence, built of rifle barrels collected from battlefields of the Civil War, surrounds this humble cabin that once sheltered the workingman who saved the Union and then served it as President.

For the student of early Western history nothing in St. Louis is more fascinating than the remarkable collection

Photograph from Frederick Simpich

BEASTS AND BEAUTIES AT THE SPRINGFIELD, MISSOURI, STOCK SHOW

shown at the St. Louis home of the Missouri Historical Society. Here are relics of those mound builders, whose faces no white man ever saw, who lived where St. Louis now stands and whose earthen monuments gave to St. Louis its nickname, "The Mound City."

Under glass cases repose many original manuscript records of the famous Lewis and Clark Expedition and many odd, interesting relics of the Mexican War.

Then there is an incomparable library of 40,000 volumes, said to form the best record of Indian and Western history extant. Families from coast to coast come to consult it when in quest of genealogical records.

Here, too, are many of the Hamilton-Burr manuscripts and one of the sledges that Peary used on his dash to the pole—a gift to the society from Peary because he had outfitted in St. Louis.

From St. Louis west and north, up the valley of the Big Muddy, all the way to Kansas City, runs one of the most intensive farm, fruit, and truck garden areas in the world. The chicken crop alone is astonishing in its magnitude. Summer boarders may fret at the crow, the cackle, and the quack that make farm life hide-

Photograph from Frederick Simpich

"SMOKES" IN A MISSOURI FIELD

Since the days when Sir Walter Raleigh measured the weight of smoke and won his wager from Queen Elizabeth, the "weed" has played an important part in the economic life of many of our States, Missouri alone manufacturing 60,000,000 pounds of "plug" tobacco yearly.

ous at dawn, but this barnyard chorus never gives the poultry man the earache.

If figures don't make you too dizzy, listen to this "triumph of the egg." In one good year, 1917, "the lay of the hen" in Missouri amounted to more than 4,000,000,000 eggs, not counting those "set" or consumed on the farms. That year poultry men sold more than $100,000,000 worth of farmyard products.

All through the State are depots where chickens, turkeys, ducks, and geese are collected by the buyers. Here hundreds of men and boys work as pickers. The feathers are sold separately and the dressed poultry is iced and shipped.

Long strings of many-decked, specially built poultry cars go east every season, accompanied by caretakers, just as the Texas cowboys still ride the cow trains into Kansas City and St. Louis to water and feed the cattle.

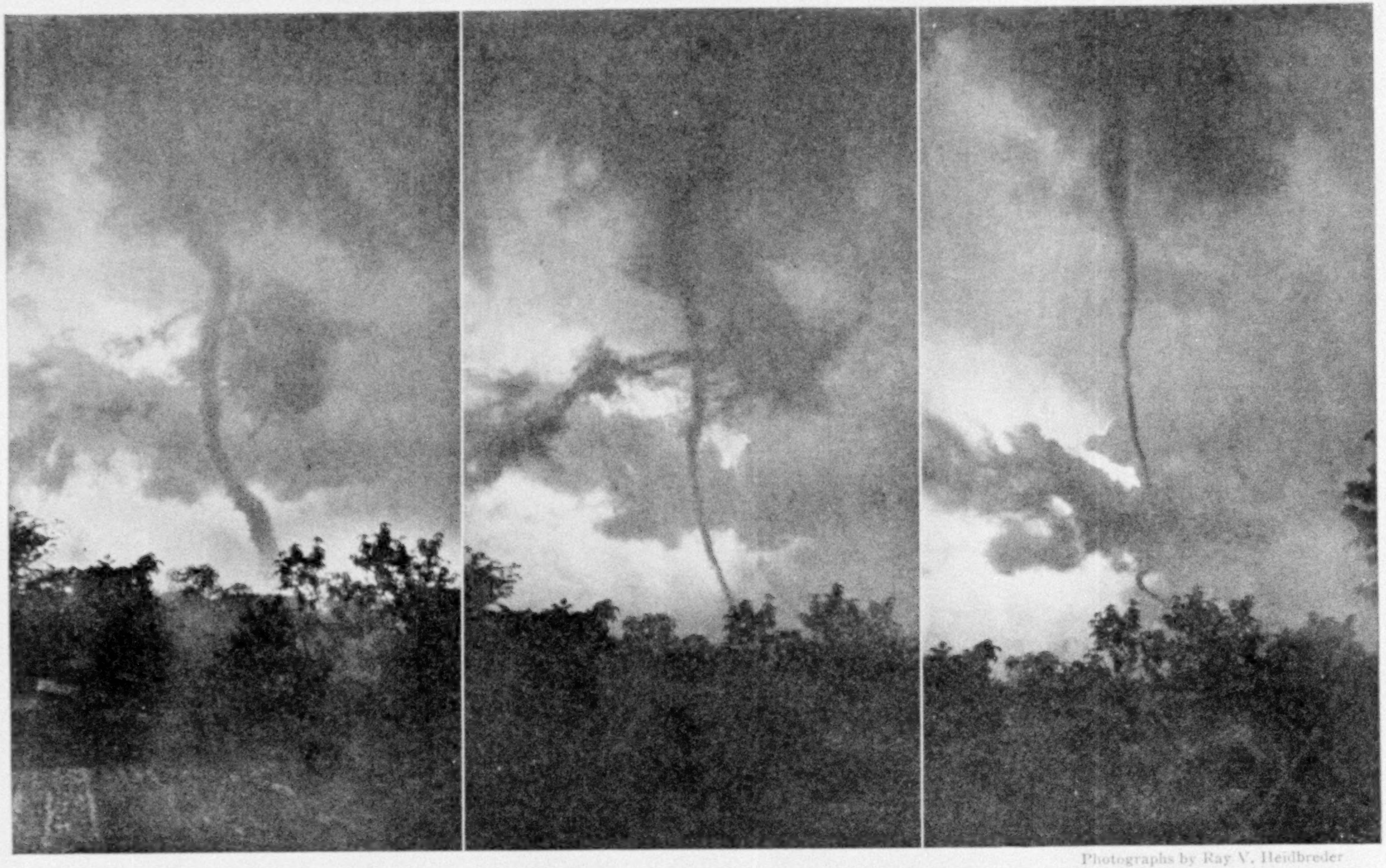
To these caretakers on the chicken trains an odd increment accrues—they are allowed to collect and sell on their own account all the eggs laid by the nervous hens on the adventurous ride to New York. And many a farm boy from a Missouri backwoods village has caught his first glimpse of the Big Town from the roof of a "poultry Pullman."

THREE MEAT-BEARING ANIMALS TO EVERY PERSON IN MISSOURI

There are more hogs than there are people in Missouri—over a million more. One prize animal was gorged with corn till he weighed 1,200 pounds, and his owner refused $15,000 for him. One official expedition sent out by the State inspected more than 10,000 hog farms and vaccinated 1,500,000 pigs in a year, saving millions of dollars from loss through disease.

Counting sheep, hogs, and steers, there are nearly three meat-bearing animals to every person in Missouri.

To show what an astounding live stock State it is, let me add that if all the horses, cows, mules, sheep, and pigs that now live here were put in a parade, head to tail, they would make a Noah's Ark procession 10,900 miles long, or reaching from Washington, D. C., to Australia.



Photographs by Ray V. Heidbreder

A PHOTOGRAPHIC RECORD OF THREE PHASES OF A "TWISTER"

These phenomena of our Middle West are not frequent visitors nor is the toll which they exact in lives heavy, for the "cyclone cellar" is an ever-ready place of refuge, but one who has seen such a serpent of the skies sweeping across the horizon does not soon forget the awe which it inspires (see text, page 443).

Horse and mule raising is falling off since the advent of the cheap "iron mule," or gas tractor. Yet there are still enough of these animals in the State to form a single file from Chicago to San Francisco, with the vanguard swimming well down toward Honolulu.

THE FAME OF THE MISSOURI MULE WON ON EVERY BATTLEFIELD

From the Marne to Manila Bay, from Manchuria to South Africa, wherever artillery has been dragged or supply trains moved, the Missouri mule is famous. He may be "without pride of ancestry or hope of posterity," but he is one of the most useful of all beasts; and for the mule the negro has a natural affinity. Far more than the white man, he senses the moods and temperament of this sinister animal.

Once in Manila Bay an army transport was unloading Missouri mules by swinging them over the ship's rail in a sling, lowering them down into the water, and letting them swim freely ashore to the flat, hot, stinking, muddy beach.

One mule swam the wrong way—straight out to sea. On deck a black trooper leaped in mirth, slapped his leg with his battered campaign hat, and yelled out: "I tell you, boss, that mule's got more sense than us niggers; he done took just one look at them there Fillypeens, turns right round, and swims back for the good old U. S. A."

ANGORA GOATS EMPLOYED TO CLEAR THE LAND

Down in the Ozarks, flocks of Angora goats are found, a few herds numbering 3,000. Some are raised for their fleece, but mostly they are used as labor-savers for clearing the hillsides of brush.

Goats are different from sheep, in that they feed with their heads up, and their natural food is shrubs, brush, sprouts, and vines. Their constant nipping of the green twigs in winter and the new growth in summer soon kills the brush, especially since the goat often stands on its hind feet to reach up high (see page 445). Sometimes a flock of goats will increase from 100 to 150 per cent in a single year.

On all the well-kept, modern stock farms of Missouri one is struck by the care paid the stock. The tale is told, though I can't vouch for it, that one futuristic farmer soothes his dairy cows at milking time by having a phonograph played in the barn.

Every year the university has "farmers' week," when all of them are invited to Columbia to hear lectures—maybe a millionaire Chicago packer comes down to give the cattle-raisers a heart-to-heart talk on the world aspects of the meat-export trade.

Guided by science, this new school of trained farmers now puts cows, calves, and pigs on a "diet" as carefully planned as that fed to rich folks at expensive sanitariums. One good new law controls the sale of commercial animal foods by compelling proper inspection, testing, and labeling.

SAFEGUARDING THE ANIMAL INDUSTRY

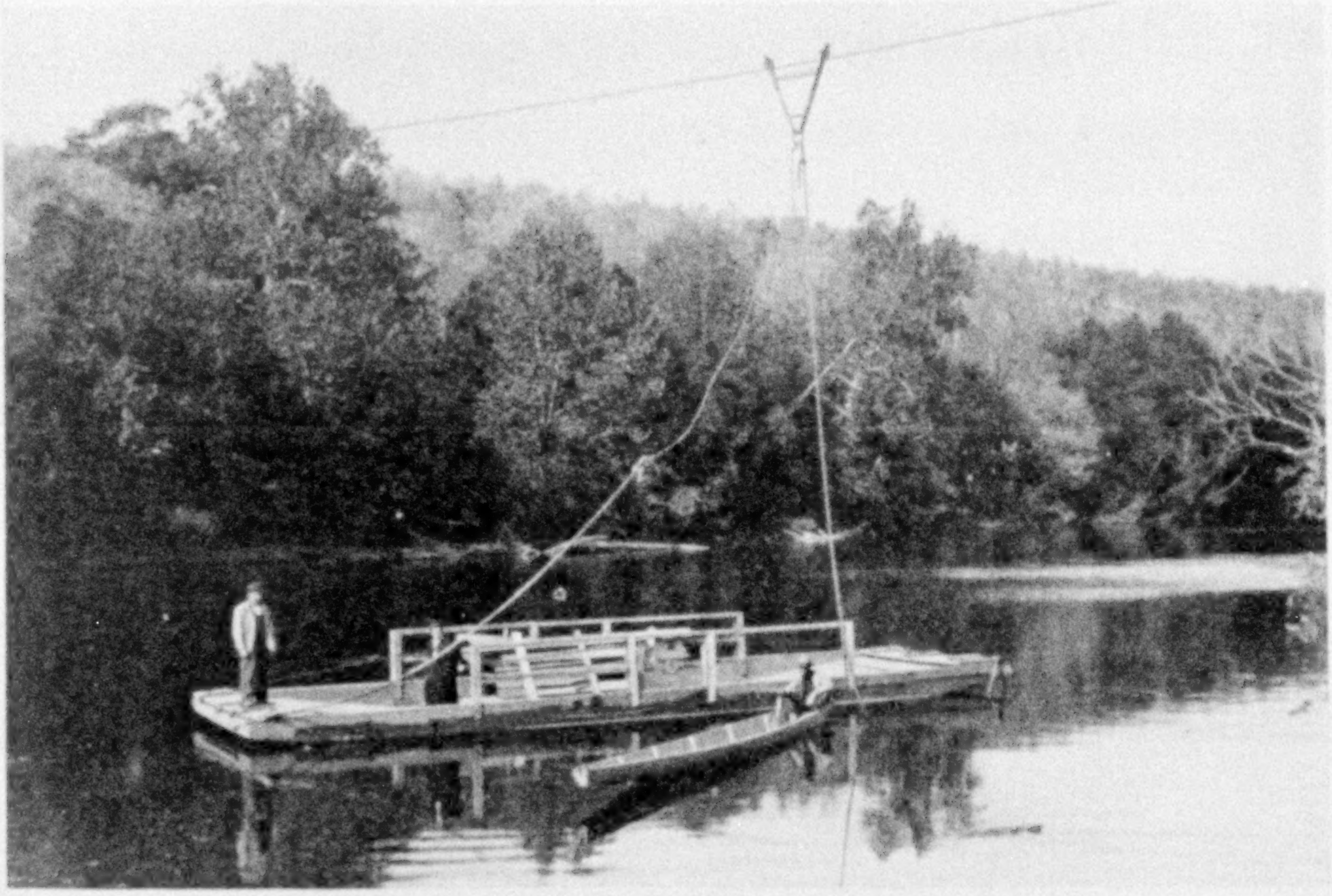
To protect the animal industry and save the farmer from fraud, as when weed seed used to be sold as "flax seed," inspection is now most rigid. In one year the State authorities inspected and approved 1,447 different varieties of commercial mixed feed for live stock.

At the numerous fairs, too, every farm exhibitor strives to outdo his neighbor in his display of fancy animals, fruits, and grains. State officials say the fairs do more to increase production and efficiency than any other form of State farm aid.

In the fight to stamp out hog cholera, the farmer is taught that contact between herds is not the only danger; that the buzzard, the crow, and even the tramp dog, are sources of danger, and that a wagon driven back to the farm from a village stockyard can carry the disease germs on its wheels.

To show how diversified its industries are, Missouri boasts that it is at once an ice State, a rice State, and a cotton State—the only one in the Union employing ice, rice, and cotton harvesters; yet its climate, to the uninitiated, is one of the worst on earth, though kindly described by the scientists as "continental."

Cane and magnolias grow here; yet the Missouri often freezes solid, and even at St. Louis the Mississippi has frozen over, so that for weeks at a time vehicles have crossed on the ice. An official record shows that once in July, at Marble Hill, the mercury climbed to 116 Fahrenheit,



Photograph by George E. Hall

AN OLD-FASHIONED FERRY ON THE WHITE RIVER IN THE OZARKS

Photograph from Frederick Simpich

THERE IS "SOME FISHING IN OZARK STREAMS"

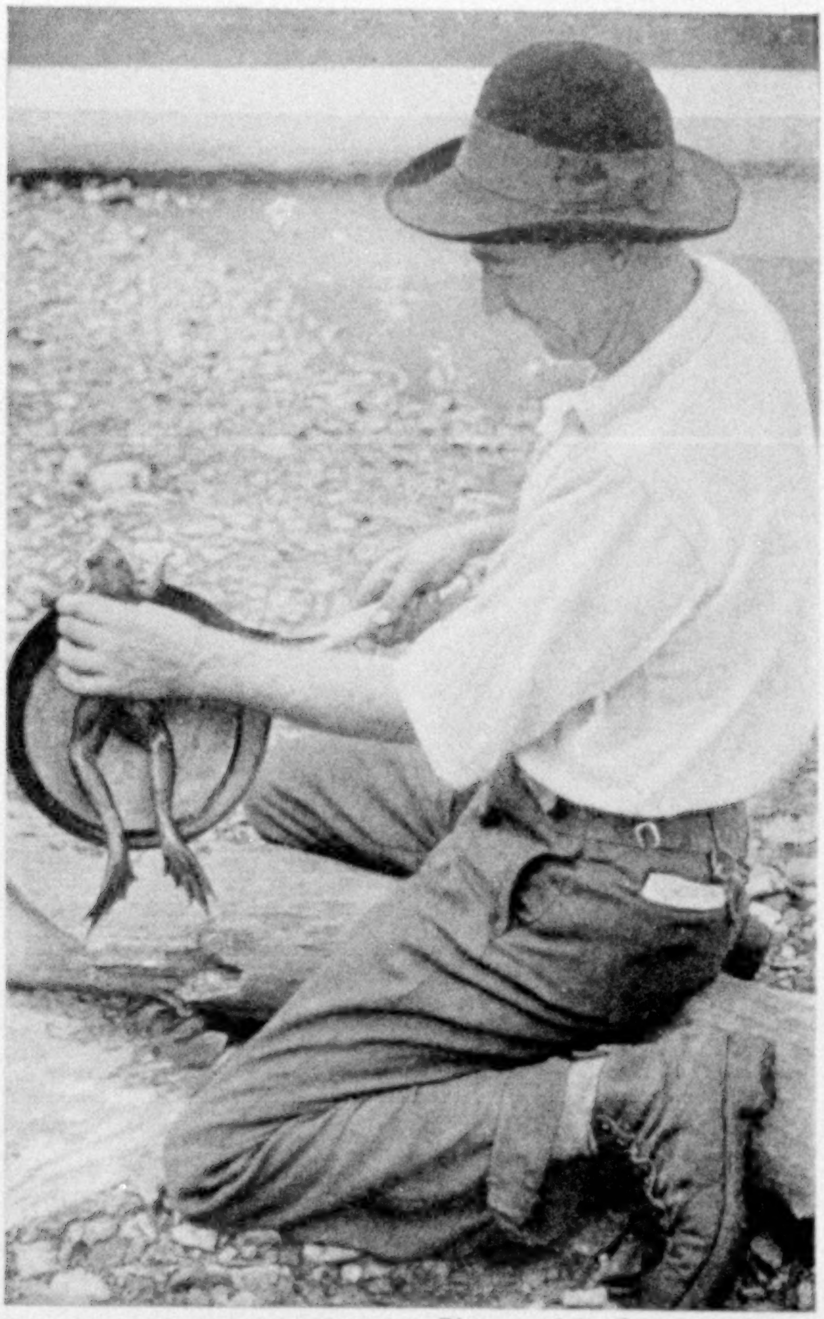
More river fish are caught in Missouri than in any other State. Black bass, perch, crappie, and sturgeon are taken from the rivers and streams in quantities.

and during February, in Benton County, it dropped to 40 below zero.

### A FAVORITE ROMPING GROUND FOR TORNADOES

Missouri, like Kansas and Nebraska, is a favorite romping ground for tornadoes and cyclones. Many a home has its specially built cyclone cellar, usually out in the yard, but conveniently near, in case a "twister" comes along. One of my earliest childhood recollections is of a hazy, stifling afternoon, a copper-colored sky, and then a roar, a sky filled with pieces of barn, trees, and fences—and a deluge of water (see page 440).

Every prudent man keeps not only his house and outbuildings insured against cyclones, but he also insures his live stock. Not only are animals killed, even carried bodily through the air during such storms, but freaks of lightning have been known to electrocute nearly all of a herd standing near a wire fence when the bolt struck.



Photograph by George E. Hall

SHOWING A MISSOURI-SIZE PAIR OF FROG'S LEGS

Year after year since the early settlements were laid waste by their first cyclone, the tales and reminiscences concerning personal adventures in these storms and the queer pranks played by the twisters have grown and grown until these yarns form no small part of native folklore.

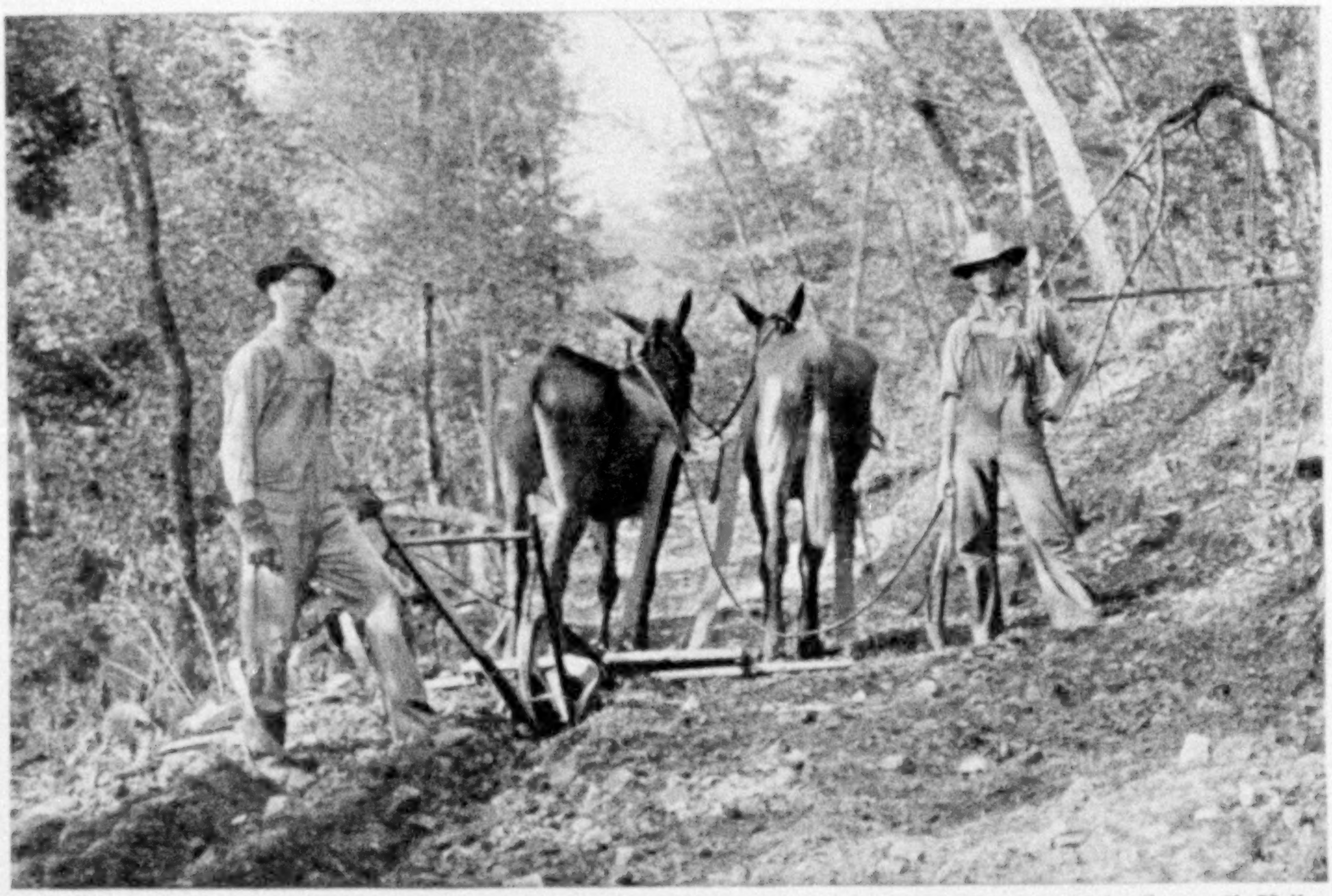
As a small boy, it used to seem to me whenever even a thundercloud appeared on the horizon some old black mammy or some imaginative hired man with a ghastly memory always took the joy out of life by predicting a "si-*cloan*" (they accent the second syllable in Missouri).

Frightful visions they conjured up, with weird tales of women left hanging by their hair in treetops after such storms; of horses carried a mile and crushed against a rocky bluff, or of ponds sucked empty of their water, all the fish being borne up into the clouds.

One does not commonly think of Missouri as a lumber State, like Washington, Oregon, or Georgia; yet much more than a third of its area is woodland. The southern half, except where it has been cleared for farms, is almost a continuous forest and is strikingly free from underbrush, giving the wooded hills a pleasant, parklike appearance.

Due to its wide range of moisture and temperature, the forest growth of Missouri is astonishing in its variety. Ash, hickory, walnuts, oaks, maples, elms, sycamores, and willows there are, of course, as well as cypress, magnolias, pines, pecans, beeches, sweet-gums, and many others.

Only in recent years, in some of the



Photograph by George E. Hall

NATIVES OF MISSOURI IN THE OZARKS

These mountains, which are in reality a dome-like plateau or uplift, cover the greater part of southern Missouri and northern Arkansas.

backwoods regions, have the natives awakened to the fact that a grove of stately old walnuts, standing in some back lot of rough gully land, is worth maybe as much as the whole farm—house, animals, and all. The wood is eagerly sought by lumbermen for furniture, veneer, and other uses.

### THE LIFE OF THE MISSOURI HOUND

And, thanks to these many forests, Missouri is the coon-hunters' paradise. In the rougher southern regions of the State nearly every farm has its pack of lean hounds—brown, black, yellow—that seem always to sprawl sleepily about, snapping at flies all day, too lazy even to howl at the stranger passing by.

It is a common saying here that the poorer the man, the more dogs he feeds. Even the poorest negro tenant farmer owns his pack of hounds—and loves them as a Filipino loves his fighting cocks. Not infrequently, at a crossroads village, at fairs, or on election day, a fight that starts between dogs winds up in a fight between the men who own them.

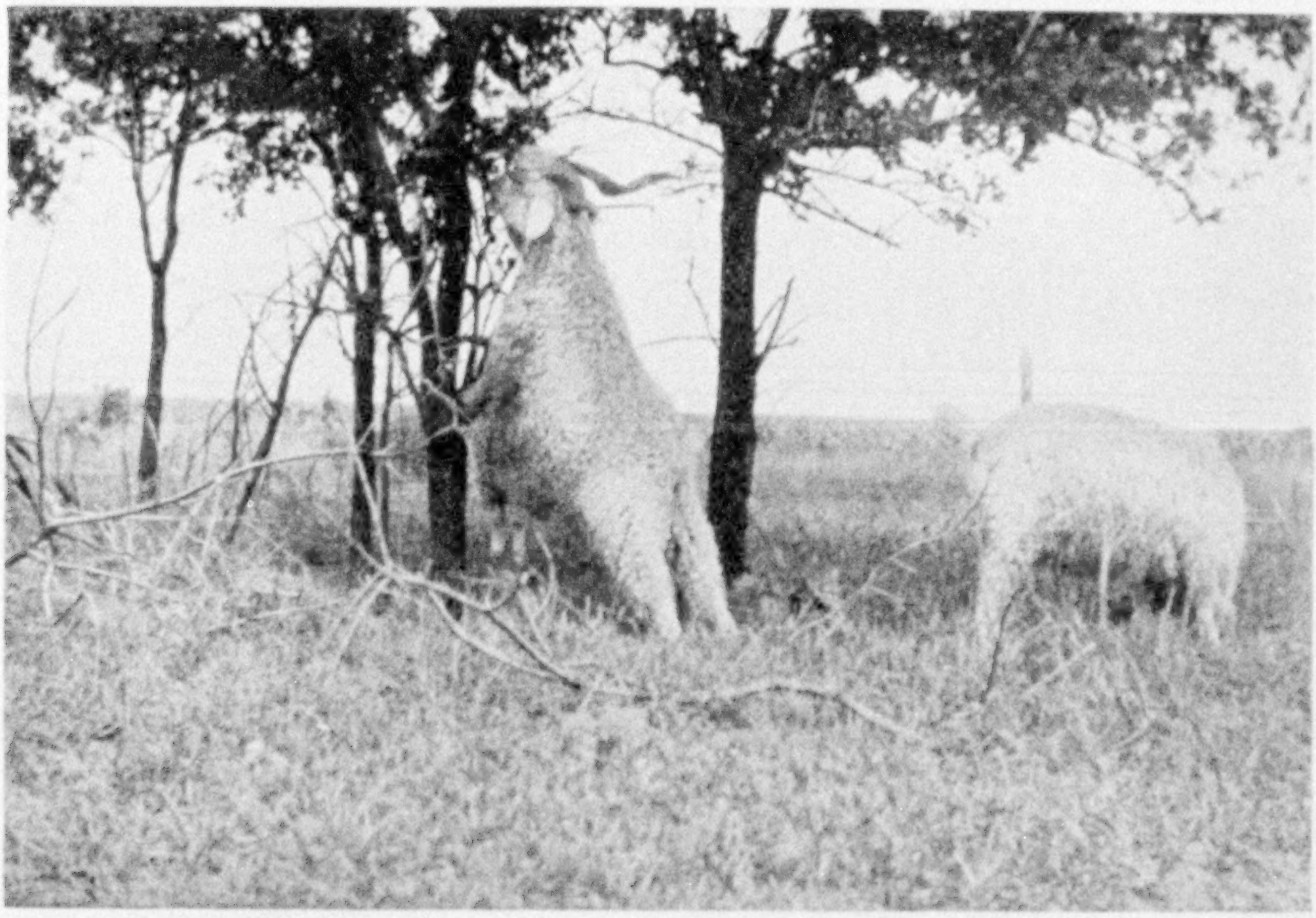
As I say, through the long, hot summer these hounds loaf about the house idle and useless, with barely enough energy to crawl after the creeping shady spots; but when autumn comes, when the farmer has done his hog-killing and gathered his corn, then the ugly, "ornery" hound comes into his own.

### A COON HUNT

It was a damp, still, faintly moonlit November night when I saw these hounds at their best.

Since they hunt better when hungry, Pete, their owner, had tied them up without food for two days. It was long after dark when he came out, untied the hounds, and blew a long blast on an old, twisted cow-horn—the signal to the countryside that the annual coon hunt was on.

Already men and boys had gathered, with lanterns, axes, and guns, and hounds of their own—hounds that slinked about, shivering, moaning, sniffing. No actor in all the sporting world seems quite so forlorn as a good coon dog when he isn't working.



Photograph from Frederick Simpich

TWO OF MISSOURI'S LABOR-SAVERS IN CLEARING LAND

Down on the Ozark plateau Angora goats are turned on the land that is to be freed of brush. The constant nipping of the green twigs by the animals during the winter season and the buds in summer soon kills the brush and vines.

There was babbling argument then and much cuffing of sulky hounds, as we planned the night's hunt, deciding our course.

In the end, Pete had his way and led off, the hounds walking quietly at his heels. Now and again he blew his horn, and some strong-lunged man in the crowd let out a long, hoarse yell.

It was only when we came to the edge of the "big woods" that the hounds, responding to Pete's imperative "Hunt 'em up, boys!" broke into long, loping strides and plunged, noses close to earth, into the dark, thick forest.

For only a little way we followed, then lay down on the dead leaves or found seats on fallen tree trunks, to smoke, to wait, talk in low tones, and to listen for the first warning cry from the dogs in the distance.

From away off to the left it soon came, that long-drawn, mournful melody of the hound, that welcome sound that stirs the heart of the born hunter as martial music stirs the soldier.

"That's old Spot," said Pete softly. "He can jump a trail a day old. When he opens his big mouth and bawls like that, it means he smells it keen," added the hunter, as we heard the hound bay once more.

Soon a second hound's warning voice came to us from the same direction, and also the shrill, excited yelps of an untutored pup, out with the veterans for his first lesson.

Judging from the sounds, the dogs were moving away from us now; so we got up and followed, Pete leading the way with the lantern. Now and again another hound gave tongue, a prolonged, musical note audible for miles on a still, damp night. Every now and then we stopped to listen.

"Come on; let's run a ways; they're gettin' too far ahead," urged Pete. And we broke into a trot.

Down a brushy hillside we slipped and slid, through a chill, muddy stream and up a steep slope, to pause for breath and listen. Now suddenly every hound in the

Photograph by George E. Hall

A CABIN IN "THE SHEPHERD OF THE HILLS" COUNTRY

Though the Ozarks are a wonderful summer playground for tourists, there are many spots in these rugged hills where the population is very sparse and means of communication are extremely limited.

pack seemed howling at once and rushing back toward us.

"They're bringin' him back down the ravine," yelled Pete, turning and leaping down the hill we had just climbed.

Everybody followed, stumbling, hastening, unmindful of sharp briars that tore his hands and of fallen limbs that barked his shins.

"He's makin' for that big holler sycamore," panted one excited youth.

"He'll never make it," bragged Pete. "Hear that Spot dog howl! I know that yell; it means he's steppin' mighty close to Mr. Coon's old tail. . . . No, sir; he'll never make the big sycamore!"

And Mr. Coon didn't. In another minute a veritable frenzy of yelps, howls, and eager canine cries came up from the bottom of the gulch, and we knew the coon was treed.

Curiously enough, all the hounds except the fool pup quit barking as we straggled down the hill and gathered about a tall elm in which the hard-pressed coon had taken refuge.

Old Spot, the veteran, walked leisurely over to the muddy stream and took a long drink. Other hounds lay on the dead leaves, panting, or sniffed about the foot of the tree.

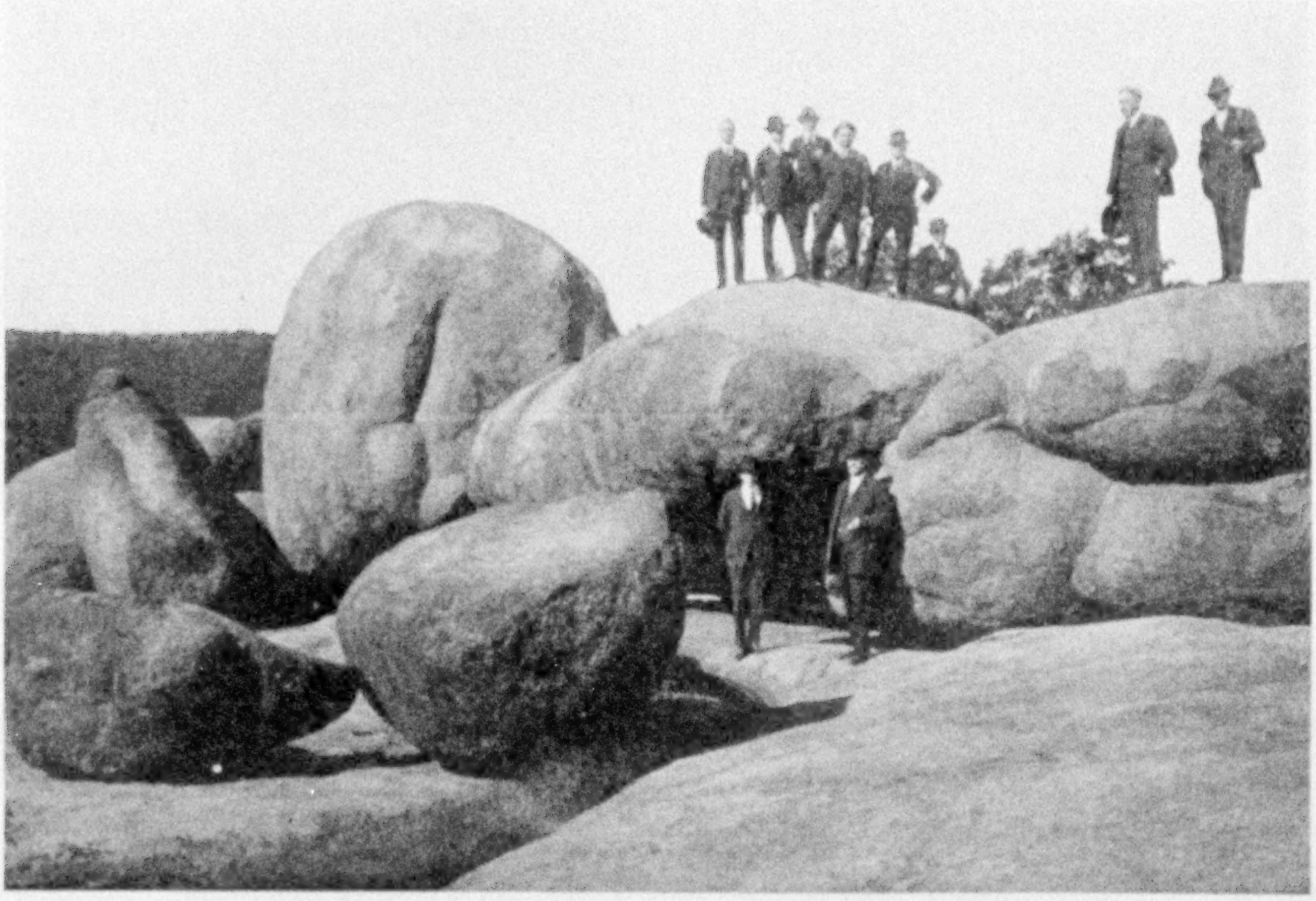
Far above, in the fork of two big limbs, I saw the bright eyes of the coon flash when a boy turned the lantern light upward. It wasn't an easy tree to climb, so men took off their coats and swung the ax.

"I told you he'd never make that big sycamore," bragged Pete.

On the smoke-house door next morning we stretched and tacked up the skin of old Mr. Coon. Later on, with many another, Pete would make up a nice, neat bundle for shipment to St. Louis. Today, maybe, some grande dame of Paris or London finds warmth, comfort, and pleasure in that fur, for the American coonskin is much esteemed in Europe.

### SMALL WILD ANIMALS INCREASE WITH HUMAN POPULATION

It is a curious phenomenon that in proportion as a country becomes more thickly



Photograph by O. C. Conkling

INSPECTING SCENERY FOR A MISSOURI ZOO

These giant boulders of Arcadia, Missouri, are to be reproduced in cement for use in providing a prowling place for lions, leopards, and tigers in the cageless animal pits of the Forest Park Zoölogical Gardens of St. Louis.

settled its small wild animals tend to increase rather than decrease. The intensive cultivation of farms, with much grain and fruit, provides for more birds and insects, which in turn supply food for more small "varmints" like coons, minks, and skunks. Where big poultry farms flourish, weasels multiply.

In cabbage, pea, and truck-farm regions, rabbits run riot and foxes get fat.

Showing how the balance of nature is maintained, I know of one instance where a chicken farmer foolishly poisoned all the foxes in his community and in a few months found his crops devoured by rabbits.

### THE FUR TRADE HELPED TO MAKE MISSOURI HISTORY

Of these facts the settlement of Missouri affords an interesting illustration. The story of the State itself begins with the coming of the whites, who set up as fur traders where St. Louis now is. Pierre Laclède Liguest poled his barge up from New Orleans, taking three months to do a trip which trains now make in 20 hours, and founded a firm which later traded as far west as the Oregon coast.

It was these hardy Missouri traders, indeed, who actually pushed the Hudson's Bay Company back when this British concern had ventured as far south as Utah.

In those early days packs of Missouri furs were carried as far as Montreal for sale. Indians, Canadians, and Americans trapped all up the Mississippi and the Missouri, and traded their pelts at St. Louis for hardware, tools, firearms, and medicines.

The skins of the bear, the deer, and the wildcat, once so common, are now, of course, no longer taken in Missouri in commercial quantities; but trade in the pelts of smaller animals has multiplied a hundredfold. It is said the bulk of all furs produced in North America comes from within a radius of 600 miles of St. Louis; and in 1920, 1,068,000 shipments came into this city.

Hardly a village in all America, where

Photograph by Robert Bagby

THE ENTRANCE TO SMALLEN'S CAVE, IN THE OZARKS

The large angular rocks on the floor of the cave have fallen from the ceiling, where the strata are horizontal. Weathering has greatly increased the size of the entrance.

Photograph from University of Missouri

THE TITLE TELLS THE TALE

One of the "floats" in the University of Missouri's Farmers' Fair Parade.

a man or a boy does trapping, but sends the pelts to St. Louis. So, famous as the town was as a fur-trade center in the days of Daniel Boone and of Lewis and Clark, the volume then was, oddly, insignificant compared to what it is now.

### ST. LOUIS IS SEAT OF WORLD'S BIGGEST FUR TRADE

Time was when Leipzig or the historic Russian fair town of Nizhni Novgorod boasted the world's biggest fur trade; now that honor goes to St. Louis.

Every year raw fur is shipped here from the far countries of the earth—from China, Australia, Siberia, and South America.

One feature of the spring auctions is the sale of many sealskins, all dressed and dyed by foreign experts employed in St. Louis—sealskins belonging to the United States Government, from the Pribilof Islands off Alaska.*

Every backwoods Missouri boy knows how to trap a "varmint," to skin it, and to preserve its pelt; and many an energetic country lad earns snug sums every winter from his traps. He knows the old raccoon may eat a little corn, the muskrat may gnaw the carrots, or the mink kill an occasional chicken; but these petty thefts are nothing compared to the value of the pelts.

### PEARL BUTTONS FROM MUSSELS

Along the Mississippi and in various Missouri streams another odd industry also flourishes. It is the quest for mussel shells and their manufacture into pearl buttons. This quest for shells has the same fascination for the mussel-hunter that prospecting has for the miner, since valuable pearls are often found in the shells. For button-making, the most desirable shells are those known as "nigger heads" and muckets.

Often whole families, camped in a tent beside the stream or living in a small houseboat, are engaged in this industry. With tongs and improvised dredges they drag the muddy bottoms of the streams to get the mussel or clam shells. The catch is then taken to the river bank and boiled in

* See "Making the Fur Seal Abundant," by Hugh M. Smith, in the National Geographic Magazine for December, 1911.

Photograph by P. R. Papin

THE BOAT BEARS THE SLOGAN OF ST. LOUIS, OF MISSOURI, AND OF MUCH OF THE MIDDLE WEST

St. Louis is reviving that river traffic which has been its heritage since Chouteau built a fur-trading post on its present site and predicted that it would become one of the country's largest cities.

huge kettles, so that the mussels may be opened and the shells cleaned.

Pearls and baroques are sometimes found in the body of the mussel itself or in the bottom of the pot after boiling. From the cleaned shells buttons are turned out by lathes into any desired size. By the use of aniline dyes, colored buttons in various shades are obtained. Poultry food and fertilizer are made out of the waste shell, which is about 95 per cent lime.

The Government has a biological station at Fairport, Iowa, on the Mississippi, where experiments in developing mussels for button-making are carried on.

### KANSAS CITY HAS RISEN LIKE MAGIC

On the western edge of the State, where the Kansas flows into the Missouri, there has risen in recent years a magic city of nearly half a million people—a city situated like Babylon of old, amid fields of waving grain, herds of asses and fat cattle.

In one year, 1919, more than 8,000,000 head of live stock were received at the Kansas City yards over the 24 railways that lead into it. In that same year, when a hungry Europe was crying for meat, some 5,300,000 animals were deftly turned into chops, bones, hams, and lard.

More than half of all the millions of dollars this great, new city makes from its factories are earned by the butchers. Curiously enough, "soap and heavy chemicals," which somehow suggest a further clever manipulation of the by-products of beef and swine, come next on the list of big sales; then flour, bread, candy, and so on.

Though in Missouri, Kansas City is not so much of it; rather is it tied up with the great grain, oil, and cow regions of the West and Southwest.

For a vivid picture of restless America, a close-up of the millions going west, I know of no more striking object-lesson than that which can be had by spending an hour in the waiting-room of the Union Station at Kansas City.

Here the homeseekers and tourists are herded, waiting for their trains to be called—long, solid trains of cane-seated tourist sleepers, bound for Texas, Idaho, Washington, California. Crowds of Greeks, of Italians, of Swedes, like the millions gone before, for some unfathomable reason pass blindly over a vast Commonwealth where good land and good jobs may still be had, lured by the call of the West.

### ITS BOULEVARD SYSTEM IS WORLD-FAMOUS

Here in Kansas City, big, busy, growing as she is, the American is still dominant. Clothing factories there are and machine shops, mills and many industries where foreigners usually seek work; yet nine-tenths of all the labor in Kansas City is American-born—singularly free from strikes, labor troubles, radicalism.

Redolent it is of herds of dusty, crowded, bellowing animals, excited from long train rides or much crowding in tight pens; redolent, too, of strange, choking odors that rise from slaughterhouses and glue factories. The packer surely earns his profit, if he has to breathe that air all day.

Up and away, however, on bluff and green wooded hill, rises the modern city—a city of singular charm, albeit newness; amazing schoolhouses, vast public playgrounds, and a park unrivaled among cities—a park and boulevard system so unusual that its fame has spread around the world.

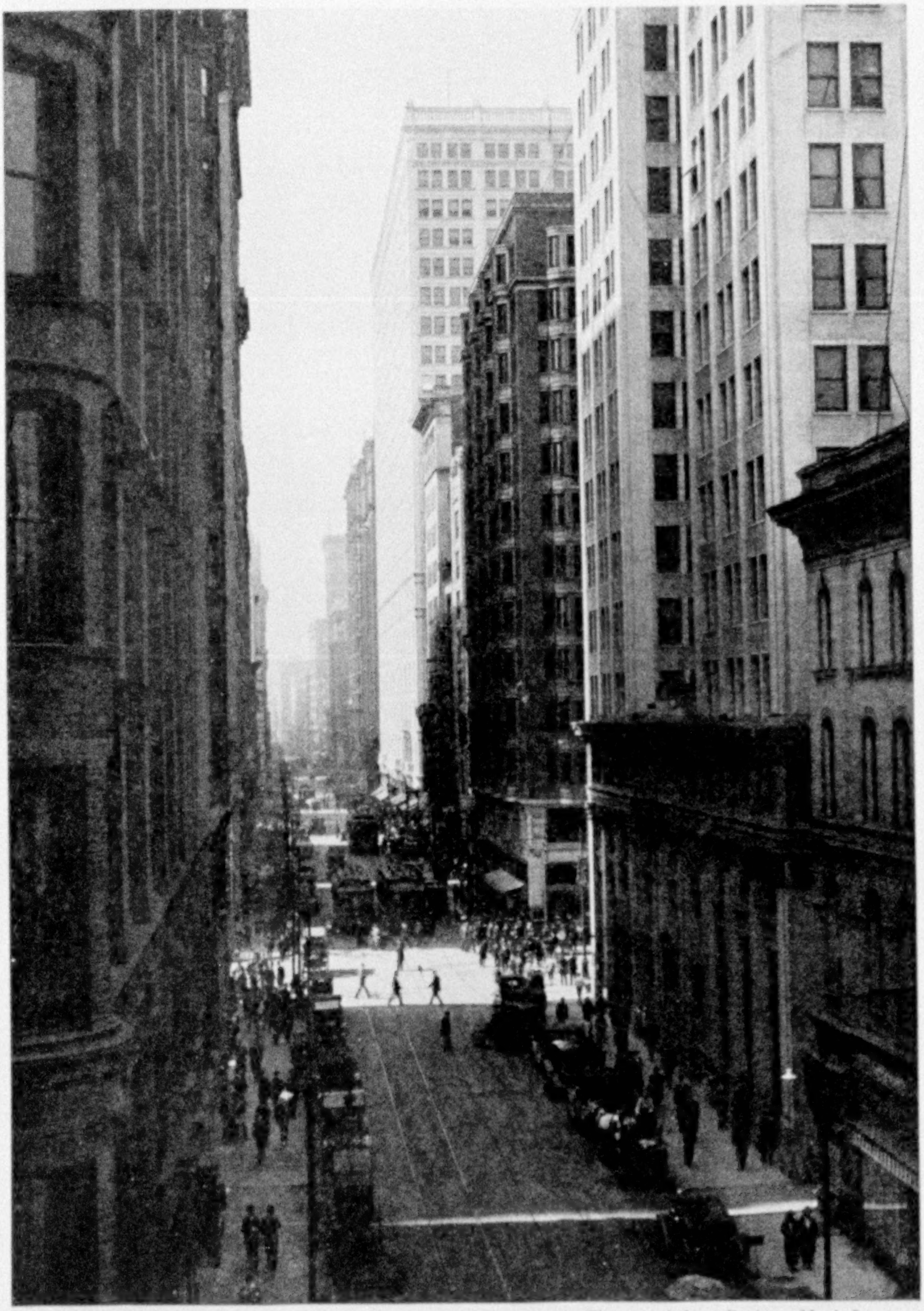
From Australia, Japan, Europe, men have come to study Kansas City's parks and boulevards, and to apply the lessons learned there to their own city planning.

So Kansas City, young, growing, using all the skill that high-priced city-planners can wield, is primping and making-up with every esthetic sense alive, calmly resolved that, in spite of stockyards and factory chimneys, she will keep her youthful beauty, her charm.

### WHEN COLLEGE MEN WERE RARE

When I was a boy on a Missouri farm, in the nineties, college graduates were curiously pointed out as intellectual personages. Even many of the most successful country lawyers had merely "read law" and passed the State bar tests; preachers, sometimes, had finished in a small theological seminary in Missouri or Tennessee, and many a doctor would have been hard put to justify his title.

Those rare characters who had been to Europe were as famous among us as Marco Polo on his return to Venice. Many a man I knew had lived to middle



Photograph from Business Men's League

ONE OF THE MAIN BUSINESS THOROUGHFARES OF ST. LOUIS

There is an air of permanence about this city which has grown so slowly and surely along with the growth of the Nation until it stands sixth in size in the United States and first west of the Mississippi.

Photograph from Frederick Simpich

UNLOADING COFFEE AT THE MUNICIPAL DOCKS, ST. LOUIS

Most of the coffee consumed in the United States comes from Brazil, and a large percentage of it comes up the Mississippi River for distribution to Eastern and Western markets from St. Louis. Here also are received shipments of sisal from Yucatan, mahogany from Central America, and sulphate of ammonia from Japan.

XUM

Photograph from Frederick Simpich

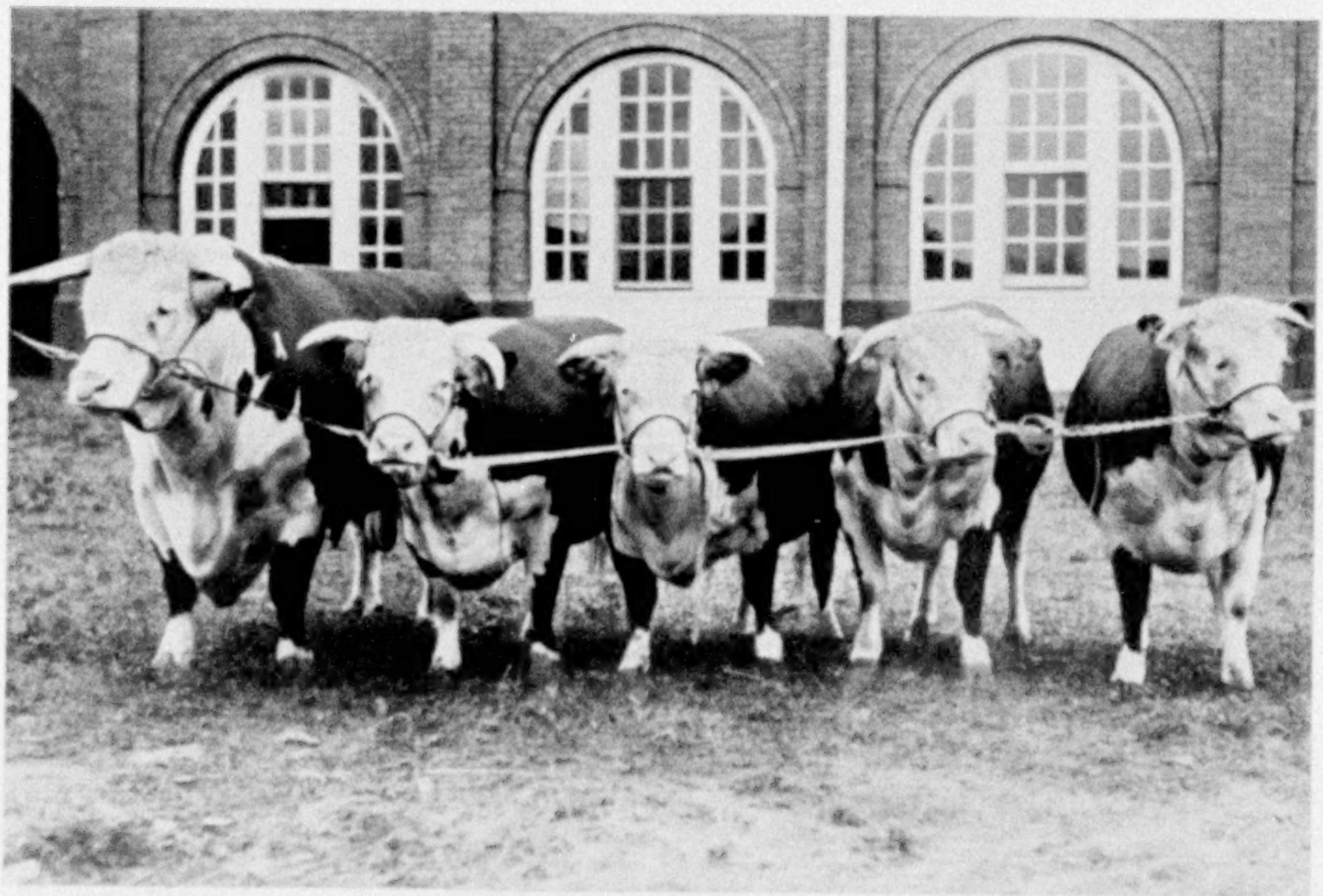
IN A MISSOURI STRAWBERRY PATCH

Photograph by W. C. Persons

MISSOURI IS PUSHING IOWA FOR HER CORN LAURELS

Missouri raised 175,275,000 bushels of corn during 1922, only Iowa, Illinois, Nebraska, and Indiana raising more. The 1920 crop showed an average yield of 32 bushels to the acre. And each year the State manufactures 28,000,000 corncob pipes.

A YARDFUL OF MISSOURI THANKSGIVING TURKEYS



Photographs from Frederick Simpich

A MISSOURI STATE FAIR EXHIBIT

These Herefords, which take their name from the county in England where they originated, are excellent as beef cattle. From the farms in central and northern Missouri, high-class breeding animals are shipped to Mexico, Europe, and South America.

Photograph from Frederick Simpich

SOME OF MISSOURI'S FERTILE FARM LAND: THE VALLEY OF THE WHITE RIVER

The southern half of the State, except where it has been cleared for farms, is almost a continuous forest, giving the wooded hills a pleasant, park-like appearance.

age right beside a railway and yet had never seen the inside of one of the "Pullman palace cars" on the C. & A. "Hummer" which whizzed from Kansas City to St. Louis—whizzed through our tranquil county without even stopping for water.

### LEAN YEARS MEANT LITTLE SCHOOLING

In those lean years following the panic of '95, dollars came rolling down the "big road" to meet nobody. Then all the boys were needed on the farm or in the country store. Many had to miss school to help gather corn or kill pigs or cut the winter's wood. In March they dropped out again, to help cut cornstalks or do the spring "breaking."

Few boys then remained in school after 16. Ray's Arithmetic, Part III, McGuffey's Fourth Reader, and Green's Grammar marked the sum total of book knowledge. But, of course, on rainy days there were young mule colts to break, minks to trap, or young foxes to dig out.

No boy really cared whether Paris was the world's most beautiful city or just a place where "Paris Green" bug poison was made.

It was enough to hear old men tell of fights with the James Boys or have them point out to us, as we set our traps along the river, the very spot where Lewis and Clark had camped, where Daniel Boone killed an Indian, or where the Quantrell Gang had held up a stage.

To-day no cultural contrast is greater. In all the State only 3 per cent of the people are illiterate. The schools of Kansas City rank second best in the Union.

Throughout the State there are 14 public seats of learning, enrolling their many thousands, belonging to the college union; besides these, there are 17 junior colleges and 44 accredited private schools.

From the famous school of journalism founded by Walter Williams at Columbia, a new generation of college-bred newspapermen is being turned out, some of whom now publish papers of their own as far away as China. The School of Mines at Rolla has become a nationally known institution.

### MISSOURI AS A PUBLISHING CENTER

Since the first *Gazette* appeared at St. Louis, in 1808, printing has become one of the State's chief industries. To-day more than 1,000 publications are issued in Missouri. The *Star* at Kansas City has often been called the greatest farm paper in America, and to tens of thousands in all parts of the Middle West the St. Louis *Globe-Democrat* is guide, philosopher, and friend.

Time was when the barn was often bigger and better than the house. Now country homes, beautiful and elaborate, are coming to be more numerous than town houses. Often, however, these show places are owned by city people.

Even the barns, fences, silos, etc., are better built. Once thought of only in terms of durability, the farmer now strives to make all these buildings attractive.

Maybe because only about one man in twenty is foreign-born, Missouri, in spite of the fact that it is the largest manufacturing State west of the Mississippi, is happily free from destructive strikes or serious labor troubles.

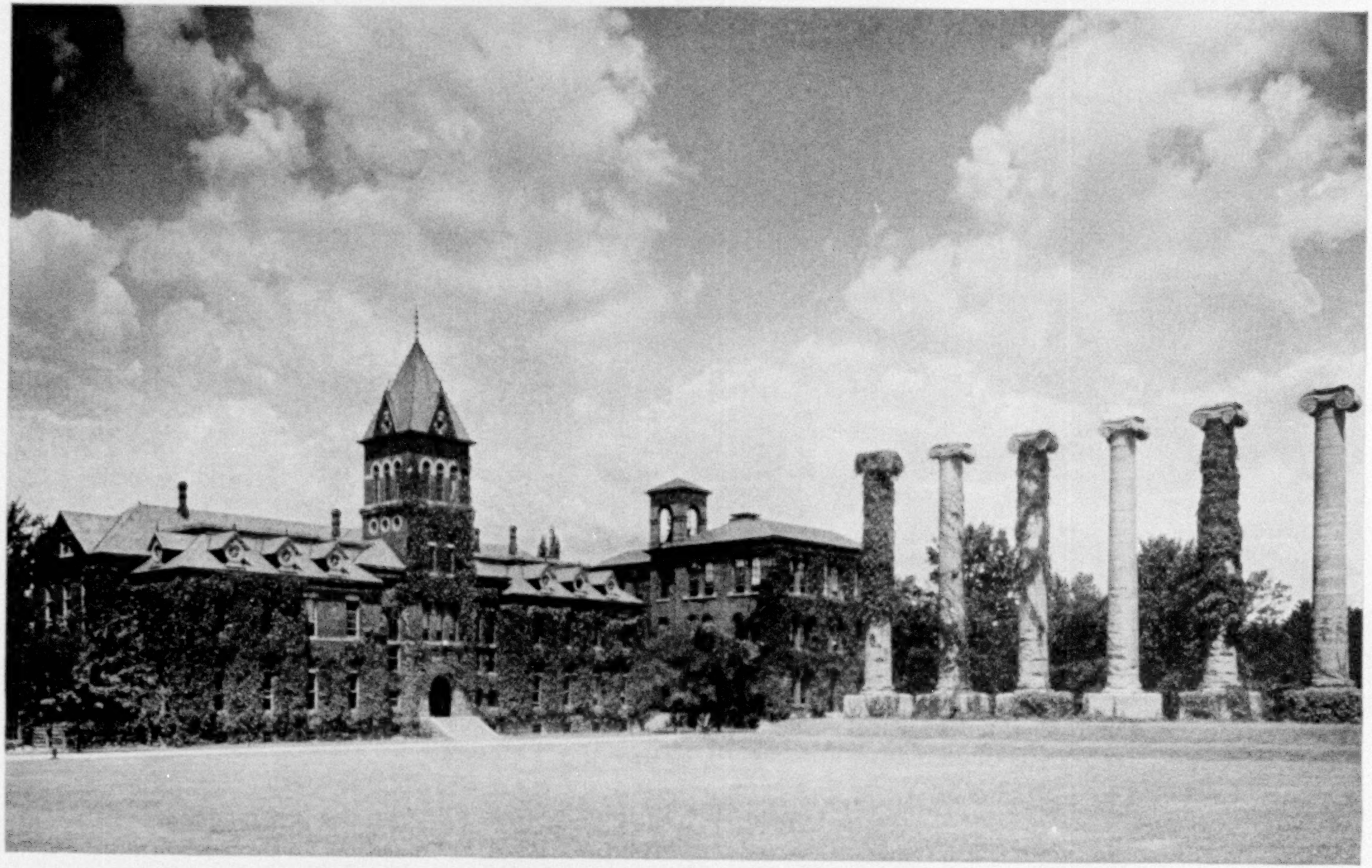
### LAW TRIUMPHS AND PROVIDES ENTERTAINMENT

Since the wild days of the bushwhackers it has cast out its devils. Lynching is rare, pistols are no longer looked on as a necessary item in a gentleman's dress; there is more of a prejudice against murder than was felt in certain turbulent counties a decade or so ago.

Time was when family feuds, neighborhood quarrels, or disputes over live stock or "line fences" were settled more or less summarily. Nowadays such cases are taken to court. And the rural Missourian, for some inexplicable reason, seems curiously addicted to lawsuits. To be called as a witness or for jury duty is, among the less thrifty country folk, accounted a happy distinction.

During circuit court week, in the smaller county-seats, farmers flock into town from miles around, and the taking of testimony, maybe in a suit over a fifty-dollar mule, is likely to afford days of sprightly entertainment.

Yet somehow, despite bucolic admiration for the glib country lawyer who, acting first the bully and then the clown, browbeats a timid, stuttering witness or makes a bewildered jury first cry and then laugh—somehow or other, justice is



Photograph from University of Missouri

A CORNER OF FRANCIS "QUAD" AT THE UNIVERSITY OF MISSOURI: COLUMBIA, MISSOURI

Every year this State institution has a "farmers' week," during which men who have been notably successful in certain lines of industry give lectures on world aspects of agricultural products (see text, page 441).

usually done and modern Missouri is a safe, peaceful place in which to live. Of all the 10,000 churches, 8,000 are in the country or in the smaller towns.

Here in Missouri that curious cultural agent, the "chautauqua," flourishes amazingly. No matter how hot the day or how dusty the roads, country people flock to town and sit for hours on small wooden seats arranged under a sweltering tent, to be lectured at, sung and played at, or laughed with, by professional entertainers.

Here all the chautauqua-circuit entertainers get in their work—every feature, from a "ladies' orchestra" or "the world's greatest magician," or the particular greatest one who happens to be billed that season, to a United States Senator or a former candidate for the Presidency.

Yet so partial are these rural communities to their own favorite old brands of intellectual refreshment that it is doubtful if Clemenceau, Coué, or Einstein, for example, would "draw" enough to pay the village bill-poster.

### POINTS IN WHICH MISSOURI LEADS THE WORLD

If you read that Arizona has the largest rattlesnakes, Manila the biggest cockroaches, or California the tallest trees, it really does help conjure up the picture. Let it be modestly set down, then, to help measure Missouri, that she holds first place in the production of lead, walnut lumber, and saddle-horses; that Kansas City is the greatest of all markets for farm tractors, hay, clay products, Hereford cattle, and winter wheat; that St. Louis ranks first among the world's markets for horses, mules, shoes, stoves, hardware, and tobacco.

People differ in opinion as to whether it is "nice" to chew tobacco, as the Malay chews his betelnut; but somewhere somebody in America is chewing a lot of it, for Missouri shops make 60,000,000 pounds a year of "plug," and to give it tone and flavor the State imports from far-away Bagdad tons and tons of roots of the licorice bush that grows wild around the old home of Nebuchadnezzar at Babylon.

From her prodigious corn crop the State saves the cobs and turns out 28,000,000 pipes a year; and, though the days of Gambrinus joys are past, she still bakes and sells carloads of pretzels every season.

More river fish are caught in Missouri than in any other State. The annual catch of fish, eels, turtles, and frogs taken by the market fishermen amounts to nearly 8,000,000 pounds. Carp and catfish predominate, but the buffalo, black bass, perch, crappie, and sturgeon are also abundant.

Any one who has spent a summer in St. Louis will recall the queer old negro peddlers who roam the streets late at night, with their singsong cry of "Crawfish, r-r-r-ed hot!"

### WONDERFUL CAVES IN THE OZARKS

In that great green, rolling region of upland prairie north of the Missouri River lie some of the finest stock farms in the world. In the south and southwest rise the Ozarks, with their rich lead and zinc deposits, their extensive orchards, their goat herds and inspiring scenery.

Here, in these classic Ozark hills, for they are not really mountains, nowhere being more than 1,800 feet in elevation, many caves have been found, some of vast dimensions and strangely beautiful interiors (see page 448).

In Stone County alone more than 100 caves have been discovered, and one of them, called Marble Cave, is truly remarkable. On top of Roark Mountain is a large sink-hole, through which entrance is had to the cave, a great palace-like cavern 330 feet long, 125 feet wide, and with an almost perfectly vaulted roof rising to nearly 200 feet at its highest point.

The walls of this vast cave are of bluish-gray limestone, and its acoustic properties are far better than those of many a church or theater. On the floor, at one end, stands a strange stalagmitic formation, in white and golden onyx, rising 65 feet in height, which the natives have named "The White Throne."

When one large cave in McDonald County was explored, various crude stone implements and the skeletons of men and animals were found. A deep pool in another cave has yielded strange fish without eyes.

From the bottom of a rocky gorge in Oregon County, in the Ozarks, there bubbles up from the bowels of the earth a

giant spring of cold, clear water—water enough, they say, to supply all of New York and the cities around it, or 650,000,000 gallons every 24 hours, to be exact.

Inevitably, as the Middle West becomes more crowded, a tide of pleasure-seekers will turn to these long-neglected Ozarks, which form one of the beauty spots of America.

Such to-day is Missouri, whose name is the basis for the most popular aphorism about any State—the Missouri of La Salle, of Father Marquette, of Lewis and Clark, Pike, Boone, Doniphan, Kit Carson, the James Boys, the Quantrell Gang and the Youngers; of General Grant; of Benton, Price, Vest, Champ Clark, Mark Twain, Eugene Field, Winston Churchill, and Marion Reedy; of Jim Reed, Pershing, and Augustus Thomas, whose play, "In Mizzoura," was made famous by Nat Goodwin in the nineties.

"Mizzoura" it was first spelled and "Mizzoura" it is still pronounced by its two and a half million native sons, who'd rather be in it than "from" it.

# OUR MAP OF THE UNITED STATES

AS THE *eighth* of a series of new maps in color compiled by the National Geographic Society and issued as supplements with the NATIONAL GEOGRAPHIC MAGAZINE since the establishment of new international boundaries following the close of the World War, The Society now presents to its members a map of our own country.

It is confidently believed that the Map of the United States, which appears as a supplement with this number of THE GEOGRAPHIC, will prove one of the most useful ever issued by The Society.

An effort has been made to overcome two difficulties which have been encountered in The Society's own offices in the use of existing maps of the United States. On the one hand, the excellent large maps prepared by the United States Government are of such size as to prevent their display on any except wide wall spaces, and it is difficult to hang them so that the user can read the small-type names at the top without mounting a ladder or chair, or those at the bottom without kneeling. On the other hand, the smaller commercial maps do not contain a sufficient amount of detail to meet the needs of many of our members.

It is believed that the accompanying map (28 x 38 inches) will be found a happy medium—of convenient size to be easily displayed on a wall or under a glass-top desk, adapted for use in the school-room or private library, and, at the same time, containing a wealth of information. More than 8,250 geographical names appear on it.

Practically every town of 2,000 or more inhabitants, according to the 1920 census, is shown, while in the sparsely settled sections of the country, where inclusion does not entail the sacrifice of legibility, places of 1,000 and 500 inhabitants are shown.

The metropolitan districts of sixteen of our largest cities are shown in separate inset maps. These insets, which are all drawn to the same scale for comparative purposes—5 miles to the inch—show not only the principal streets, parks, suburban sections, interurban lines, and all railways entering each city, but also the contiguous municipalities.

So important is the motor traffic of the United States that it has been deemed advisable to indicate, by name and corresponding number, 34 of the most extensively used automobile highways, and the increasing use of our national parks as playgrounds by all the people warranted the inclusion of the park-to-park highways.

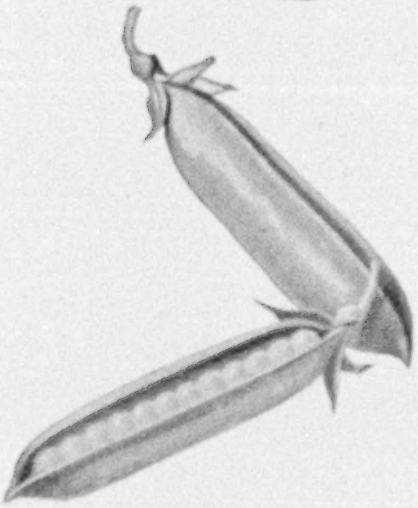
All the major passenger railway lines of the eastern half of the United States are shown and named, while practically all interstate railways are indicated in the territory west of the Mississippi River.

The map will prove of special interest in connection with the article on "America's Amazing Railway Traffic," in this number.

Additional copies of the Map of the United States may be obtained from the headquarters of the National Geographic Society, in Washington, D. C., at $1.00 each, for the paper edition, $1.50 on linen, mailed postage free in the United States; foreign postage, 25 cents additional.

# *The rich purée of tiny, sweetest peas*

Smooth, wholesome, inviting pea soup! What a delightful and refreshing dish it is! It's a soup that everybody likes both for its delicious flavor and its generous, satisfying nourishment. The very name "pea soup" is a promise to your appetite. Do not disappoint it. Campbell's delights the taste eager for pea soup that has the real flavor and richness. The puree is richer still for the fine butter which is blended in. The delicate seasoning gives just the right appetizing touch. Once taste it, and you will serve Campbell's every time you have pea soup!



**Cream of Pea**

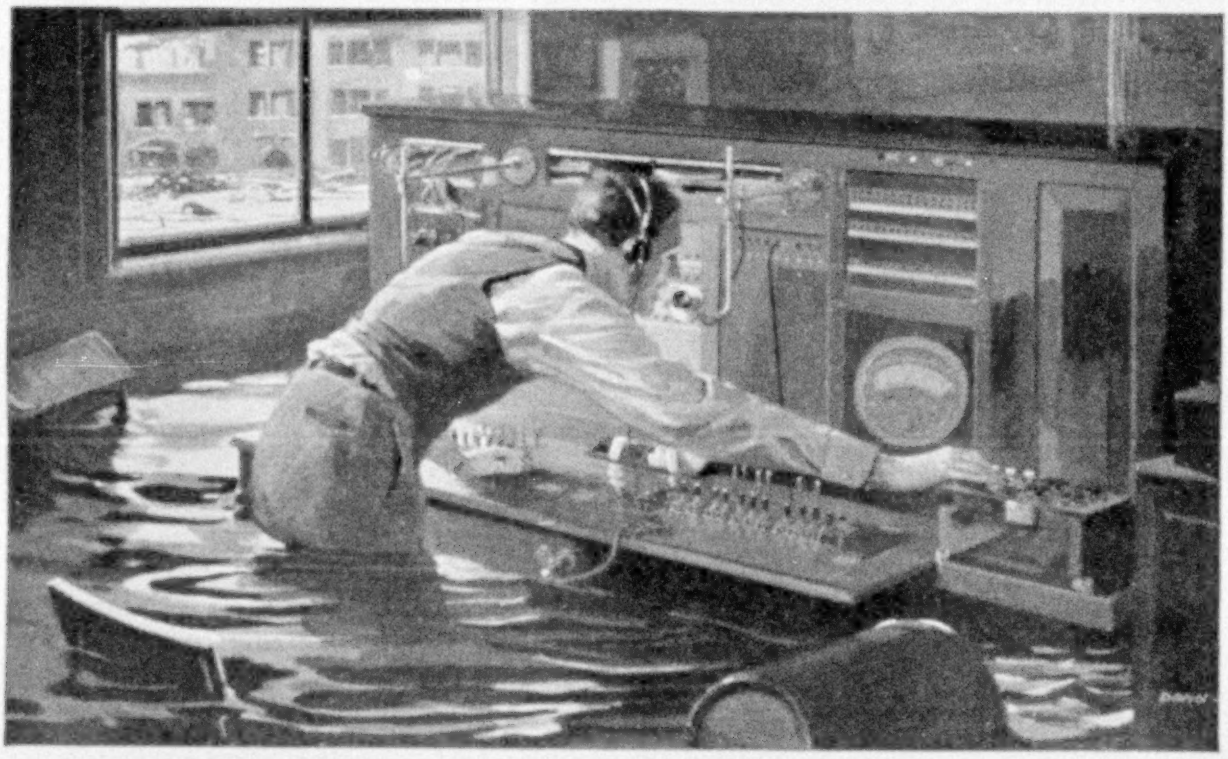
If you wish a Cream of Pea that will be your pride, just follow the simple directions on the label for making it with Campbell's.

**21 kinds** **12 cents a can**

# Campbell's Soups

LOOK FOR THE RED-AND-WHITE LABEL

XUM




# Why they stick

On the ground floor of the telephone building a man worked at the test board. It was night; flood had come upon the city; death and disaster threatened the inhabitants. Outside the telephone building people had long since sought refuge; the water mounted higher and higher; fire broke out in nearby buildings. But still the man at the test board stuck to his post; keeping up the lines of communication; forgetful of self; thinking only of the needs of the emergency.

On a higher floor of the same building a corps of telephone operators worked all through the night, knowing that buildings around them were being washed from their foundations, that fire drew near, that there might be no escape.

It was the spirit of service that kept them at their work—a spirit beyond thought of advancement or reward—the spirit that animates men and women everywhere who know that others depend upon them. By the nature of telephone service this is the every-day spirit of the Bell System.

The world hears of it only in times of emergency and disaster, but it is present all the time behind the scenes. It has its most picturesque expression in those who serve at the switchboard, but it animates every man and woman in the service.

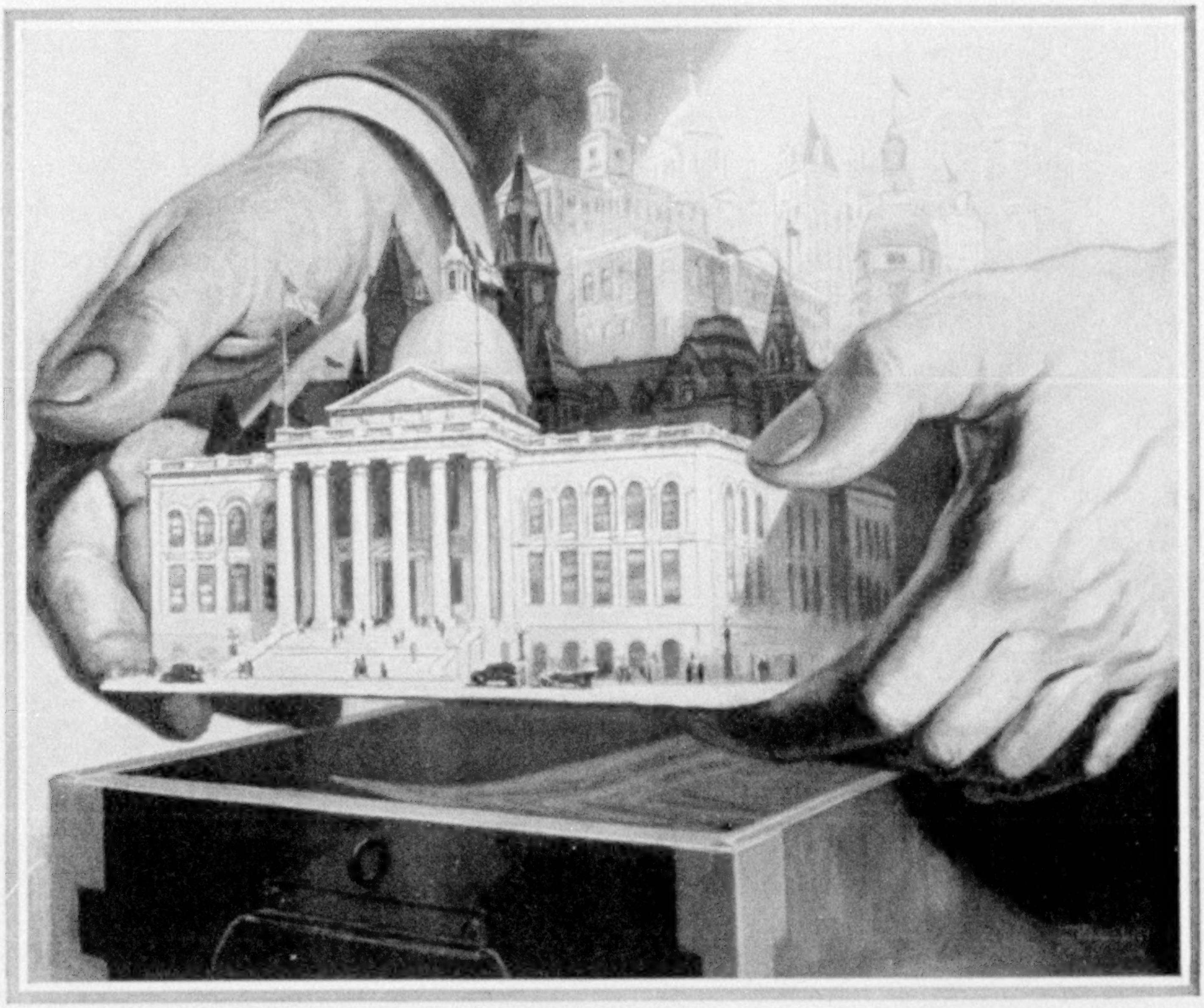
Some work in quiet laboratories or at desks; others out on the "highways of speech." Some grapple with problems of management or science; some with maintenance of lines and equipment; others with office details. But all know, better than any one else, how the safe and orderly life of the people depends on the System—and all know that the System depends on them.

"BELL SYSTEM"

AMERICAN TELEPHONE AND TELEGRAPH COMPANY

AND ASSOCIATED COMPANIES

*One Policy, One System, Universal Service, and all directed toward Better Service*




# A community's promise to pay

SO strong is the security of good Municipal and State Bonds that State laws approve them as suitable investments for Savings Banks.

Such bonds promise to pay you their face value after a definite term of years, and yield interest free from Federal income tax.

The National City Company has learned through years of analytical study the factors which make certain Government, State, Municipal, Railway, Public Utility and Industrial Bonds more desirable than others.

The results of the Company's latest studies will be found in a list of recommended Bonds—a copy of which will be mailed on request.

THE NATIONAL CITY COMPANY
NATIONAL CITY BANK BUILDING
NEW YORK

**The National City Company**

National City Bank Building, New York

*Offices in more than 50 leading cities throughout the World*

BONDS SHORT TERM NOTES ACCEPTANCES

*Announcing*
*a new*
*KODAK*

Price $65
Picture $2\frac{7}{8} \times 4\frac{7}{8}$ inches

## No. 2C Autographic Kodak, *Special*

So popular have the 2C proportions become that there has been a growing demand for a camera with superior equipment making pictures in this ideal size.

And that is the reason for this new model, the 2C Autographic Kodak Special, with Kodak Anastigmat *f*.6.3 and Kodamatic Shutter. It's the kind of a camera the camerist wants, in a size he prefers.

Kodak Special means just that—*Special.* The famous Kodak Anastigmat lens *f*.6.3 cuts sharp and takes full advantage of the seven accurate snap-shot speeds from 1/2 to 1/150 of a second accorded it by the Kodamatic shutter.

Equipment includes as well the Kodak Range Finder that finds the focus, rising front, autographic feature and an automatic exposure plate that gives at a glance the proper shutter speed under the light conditions that obtain and with the lens opening used. The camera is made of aluminum, for lightness, and covered with finest sealskin, for looks.

There's pride in owning such a splendid instrument as the 2C and the sharp, brilliant pictures it makes are a genuine joy.

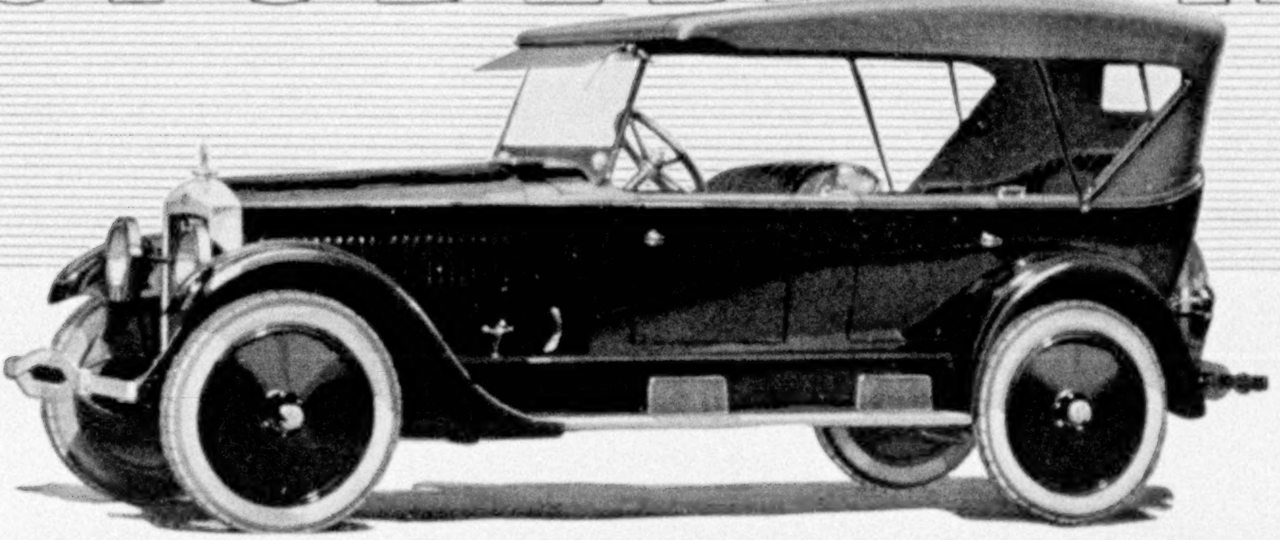
See this *Special* at your dealer's

Eastman Kodak Company

Rochester, N.Y. *The Kodak City*

The KODAK ANASTIGMATS
*f*.7.7 *f*.6.3 and *f*.4.5

# STUDEBAKER



THE BIG SIX TOURING CAR $1750

STUDEBAKER has again demonstrated, in the 1923 series Big-Six Touring Car, that it is not necessary to pay a fancy price for a motor car of highest quality.

Fundamentally the same splendid automobile that 50,000 owners have found so satisfactory, this fine car incorporates all the new year's betterments and improvements.

Its performance is as exceptional as its beauty. It is unvarying in its dependability, comfortable for any journey, and is completely equipped with every feature for convenience and utility—even to the extra disc wheel with cord tire and tire cover and handsome nickel-plated bumpers.

The limited production of most of the better cars increases overhead expense and raises the cost of every manufacturing operation. This necessitates a high selling price and decreases intrinsic values.

The fact that Studebaker builds nothing but sixes, in large volume, and manufactures all vital parts in its own factories, enables it to reduce costs, eliminate parts-makers' profits and give more for the money.

Studebaker plant facilities are adequate for the most economical manufacture. Raw materials are bought at the lowest possible prices, labor is specialized and efficient, and overhead per car is reduced to a minimum.

These savings are reflected in the price of the Big-Six Touring Car.

Studebaker maintains quality standards that are second to none. Materials and craftsmanship are unexcelled.

The name Studebaker stands for highest quality and honest value.

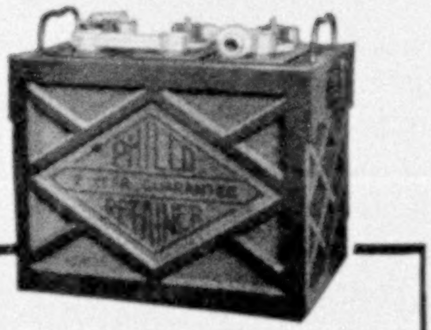
THE STUDEBAKER CORPORATION OF AMERICA
South Bend, Indiana

1923 MODELS AND PRICES—*f. o. b. factories*

| LIGHT-SIX *5-Pass., 112" W. B., 40 H. P.* | | SPECIAL-SIX *5-Pass., 119" W. B., 50 H. P.* | | BIG-SIX *7-Pass., 126" W. B., 60 H. P.* | |
|---|---|---|---|---|---|
| Touring . . . | $975 | Touring . . . | $1275 | Touring . . . | $1750 |
| Roadster (3-Pass.) | 975 | Roadster (2-Pass.) | 1250 | Speedster (5-Pass.) | 1835 |
| Coupe-Roadster (2-Pass.) . . | 1225 | Coupe (4-Pass.) | 1875 | Coupe (4-Pass.) | 2400 |
| | | | | Coupe (5-Pass.) | 2550 |
| Sedan . . . . | 1550 | Sedan . . . . | 2050 | Sedan . . . | 2750 |

THIS IS A STUDEBAKER YEAR

*Courtesy of Mrs. H. A. B., Jr.*
*—and then HE bought a Philco.*




# Wanted—*a Philco!*

Cranking a big, stiff-jointed motor is "no business for a lady"—any time. In emergencies—when battery failure means distress and even peril—safety demands the lavish, steadfast power of a Philco Battery.

And that's why motorists, by thousands and thousands, are replacing their ordinary batteries with Philco Slotted-Retainer Batteries—the highest-powered, longest-lived Philco Batteries ever built for automobile service.

Just a turn of the switch—a touch of the starter—and your motor whirls! No "flunking" where danger threatens. No stalling in traffic. No leaving you stranded, night coming, miles from a service station.

Philco's tremendous reserve power—its rugged, shock-proof strength—its day-in, day-out dependability—are due to Philco exclusive over-size construction *plus famous time-tested features that make its two-year guarantee conservative.*

Install a Philco NOW. Safeguard yourself and family against hand-cranking experiences. Get the assurance of quick, sure-fire ignition—brilliant lights—a blaring horn. A Philco now costs you no more—*in many cases even less*—than just an ordinary battery.

Philco Slotted-Retainer Batteries are built for every make and model of car. There's a Philco Service Station near you. Write for address, if necessary.

Philadelphia Storage Battery Co., Philadelphia

*The famous Philco Slotted-Retainer Battery is standard for electric passenger cars and trucks, mine locomotives and other battery uses where long-lasting, low-cost service is demanded.*
*Whatever you use batteries for, write Philco.*

## PHILCO
SLOTTED-RETAINER
BATTERIES

*with the famous shock-resisting Diamond-Grid Plates*

## *3-Point Superiority*

1. The Famous Diamond-Grid—the diagonally braced frame of a Philco plate. Built like a bridge. Can't buckle—can't warp—can't short-circuit. Double latticed to lock active material (power-producing chemical) on the plates. Longer life. Higher efficiency.

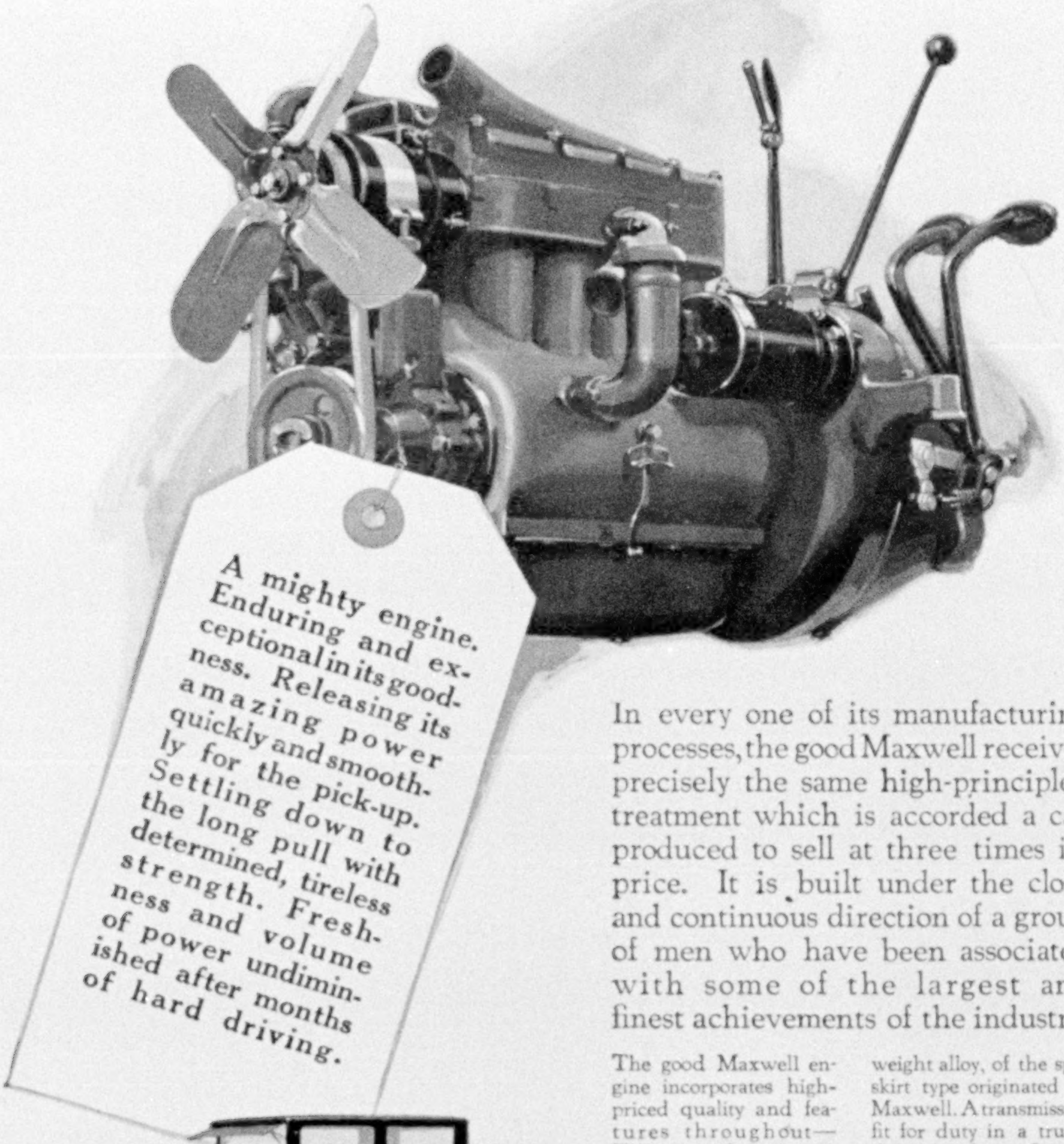
2. The Philco Slotted Rubber Retainer—a slotted sheet of hard rubber. Retains the solids on the plates but gives free passage to the current and electrolyte. Prevents plate disintegration. Prolongs battery life 41 per cent.

3. The Quarter-Sawed Hard-Wood Separator—made only from giant trees 1,000 years old; quarter-sawed to produce alternating hard and soft grain. Hard grain for perfect insulation of plates. Soft grain for perfect circulation of acid and current—quick delivery of power. Another big reason why Philco is *the* battery for your car.

### LOOK FOR THIS SIGN

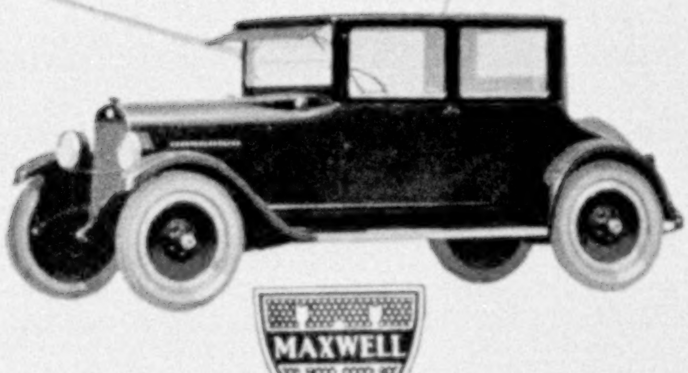
of Philco Service. Over 5,500 stations—all over the United States. There is one near you. Write for address, if necessary.

PHILADELPHIA
DIAMOND
GRID
BATTERY
With the PHILCO Slotted Retainer




In every one of its manufacturing processes, the good Maxwell receives precisely the same high-principled treatment which is accorded a car produced to sell at three times its price. It is built under the close and continuous direction of a group of men who have been associated with some of the largest and finest achievements of the industry.

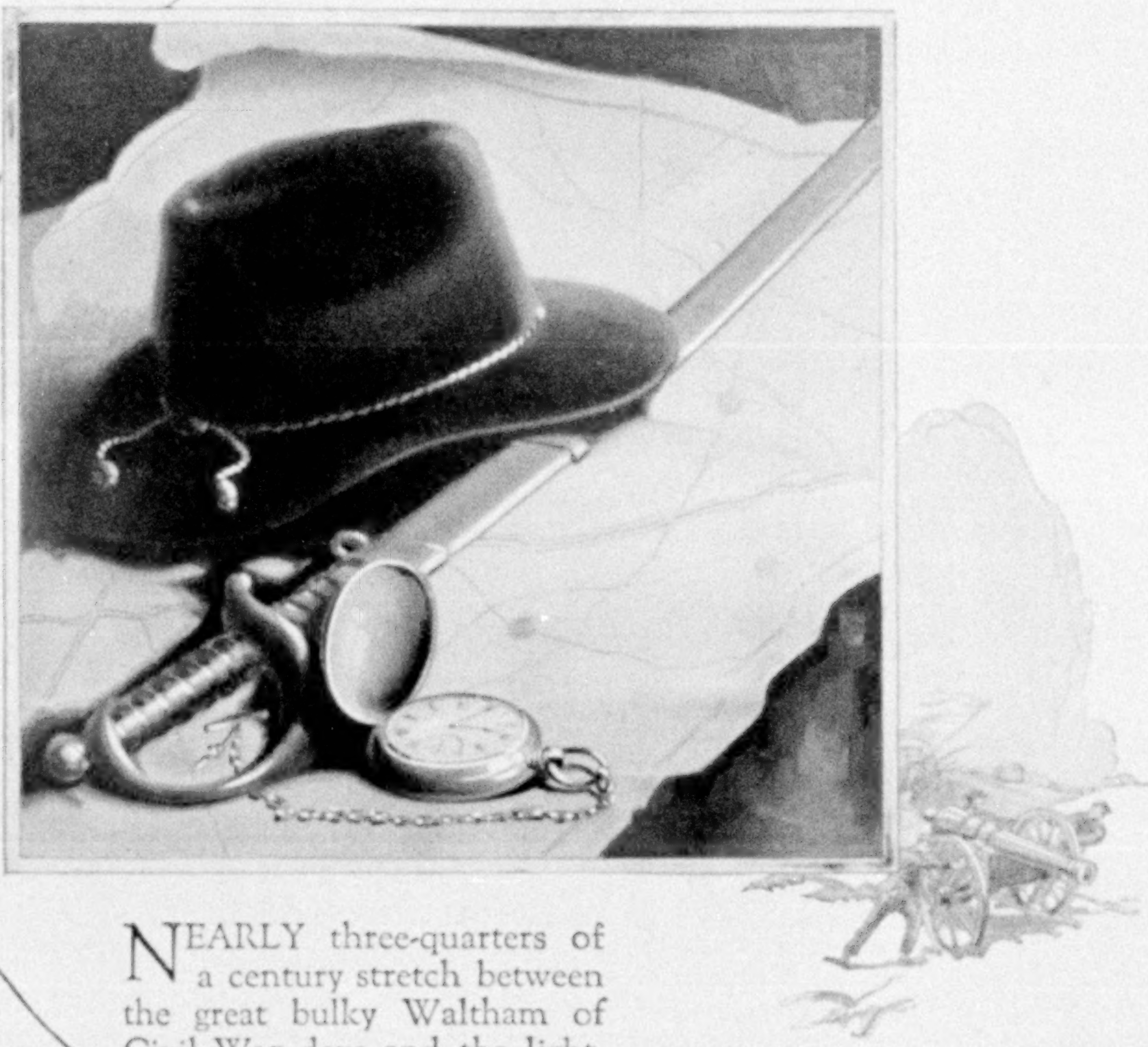
The good Maxwell engine incorporates high-priced quality and features throughout—Three extra-large crankshaft bearings; full pressure lubrication to main and connecting-rod bearings, through channels bored in the crankshaft; all rotating and reciprocating parts, even to the fly-wheel, minutely balanced; pistons light-weight alloy, of the split skirt type originated by Maxwell. A transmission fit for duty in a truck. A rear axle as fine in construction, and as modern in design, as an axle can be built today—Gears chrome nickel steel, spiral cut; straddle pinion bearings; extra large ball bearings for wheels; heavy gauge pressed steel, tubular housing.



*Prices F. O. B. Detroit. Revenue tax to be added: Touring, $885; Roadster, $885; Club Coupe, $985; Sedan, $1335; Four Passenger Coupe, $1235*

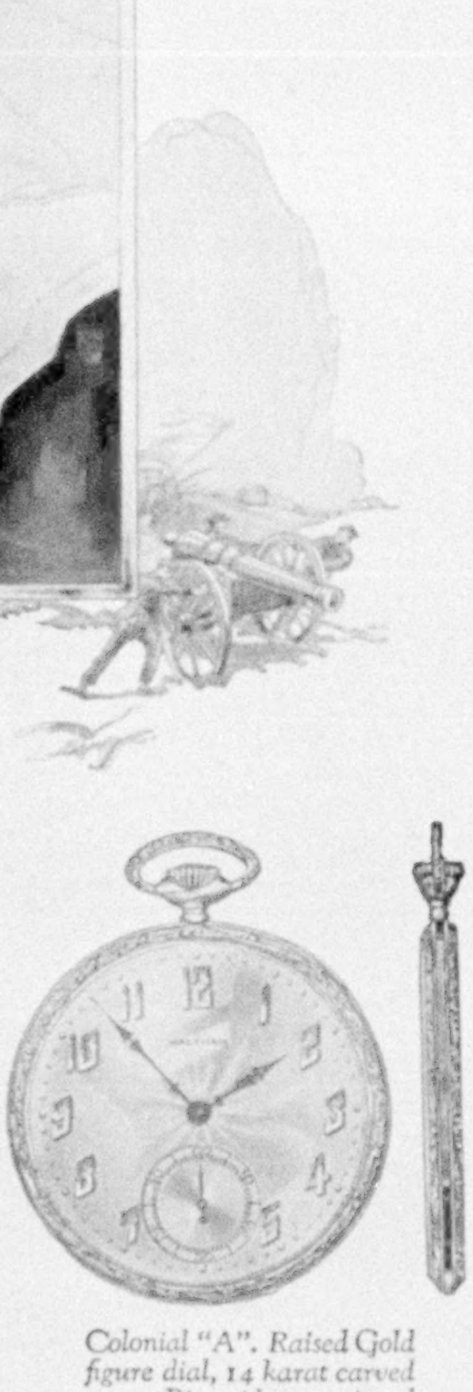
MAXWELL MOTOR CORP., DETROIT, MICH.
Maxwell Motor Company of Canada, Ltd., Windsor, Ont.

# The Good MAXWELL



NEARLY three-quarters of a century stretch between the great bulky Waltham of Civil War days and the light, thin, though equally sturdy model of today. And yet a series of common ties binds the old to the new. Each stands for the supreme achievement in watch-making of its day. Each represents the highest degree of accuracy and dependability of its period. And most important of all, each bears a name that throughout the years has guaranteed watch quality to the world—WALTHAM!

WALTHAM WATCH COMPANY
WALTHAM, MASS.



*Colonial "A". Raised Gold figure dial, 14 karat carved case. Riverside, 19 jewel movement . . . . $175.*

# WALTHAM

THE SCIENTIFICALLY BUILT WATCH

Good Buildings Deserve Good Hardware
CORBIN
"I wish our locks worked like that."
"Yes—we are proud of our hardware—it's Corbin."
THAT'S the way with good hardware—the longer you live with it, the better you like it. Its beauty, its prompt, precise action, the sense of security it inspires in you when you "lock up" for the night—make it ever so worth while.
Today, more and more people are showing their contempt for shoddy building by insisting on good materials and good workmanship. These people know that Good Buildings deserve Good Hardware.
"Good Buildings Deserve Good Hardware" is a booklet you should read, if you are planning to build. Write for it.
P. & F. CORBIN SINCE 1849 NEW BRITAIN CONNECTICUT
The American Hardware Corporation, Successor
New York Chicago Philadelphia

PURPLE MARTIN HOUSE

*Martins feed on winged insects, especially the mosquito. One martin will eat a thousand a day; and a colony, hundreds of thousands.*

*Cottage style, cypress, "the wood eternal," painted green and white, 28 compartments. To go on pole. 26 x 27 x 31 inches. Price $16.00. Other styles up to $75.00.*

BLUEBIRD HOUSE

*The gentle bluebird note is the very spirit of Spring. Early and all summer they will destroy the cut worms and caterpillars.*

*Of everlasting fir, with cypress shingles, and copper coping that dispels lightning. Four compartments. To set on top of pole or other support. 21 in. high, 18 in. diameter. Green. Beautiful as gifts. Price $6.00.*

Dodson
**Bird Houses**

## YES! SAVE YOUR TREES AND SHRUBS

Spraying, pruning, re-planting, make a place expensive. The song birds can help you! Put up a few Dodson Bird Houses. Next year you'll add more to them. For the birds save your trees and shrubs and garden from daily insect ravages! Good citizens everywhere are heeding this. Before the buds and plants appear, up go the houses to weather. The birds come. They raise three and four broods thru the summer. They work merrily from dawn till dark. Know the work of the song birds. And don't forget the exquisite beauty and song to be enjoyed. Dodson Bird Houses are scientific, successful homes built for the birds. See them everywhere. Shipped promptly from Kankakee to you.

JOSEPH H. DODSON 702 Harrison Avenue KANKAKEE, ILLINOIS

**Mr. Dodson is President of the American Audubon Association**

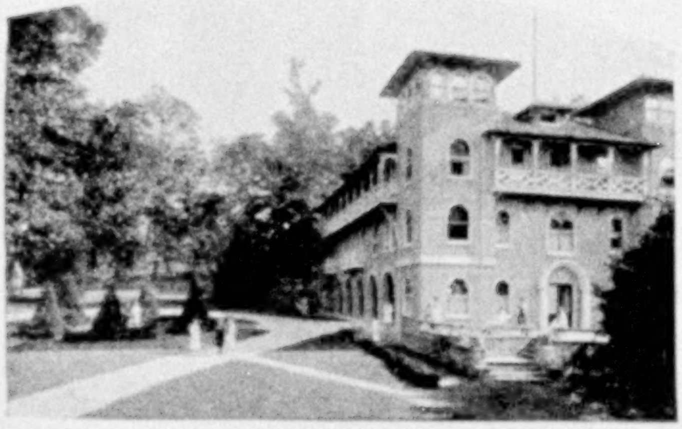
SEE WHAT THE WREN EATS

*Government research has disclosed the birds' infinite value. Letters reach us daily from happy Dodson Bird House owners.*
*Quaint Wren House, 4 compartments. Price $6.00*

FREE *Mr. Dodson's fascinating booklet "Your Bird Friends and How to Win Them" gladly sent upon request. Forty years' loving study of the birds has completed it.*

*Write to Mr. Dodson. He will advise on attracting the birds to your home wherever you live! Large estate or city garden.*

*Dodson Famous Sparrow Trap Guaranteed to Remove this Pest, $8.00*



# National Park Seminary

*For Young Women*

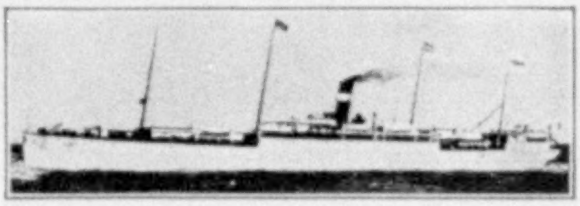
Suburbs of Washington, D. C.

JAMES E. AMENT, Ph.D., LL.D., *Pres.*

Two-year Junior College courses for high school or preparatory school graduates. Vocational courses. Music, Art, Expression, Dramatics. Home Economics with special diploma granted. College preparatory department for younger girls. Beautiful ninety-acre campus in Rock Creek Valley. Outdoor activities, including horseback riding. Gymnasium and swimming pool. Eight charming clubhouses are the centers of students' social activities. References required. Address

MISS GLADYS A. SHELDON, *Registrar*
Forest Glen, Maryland

# The Candler Floating School



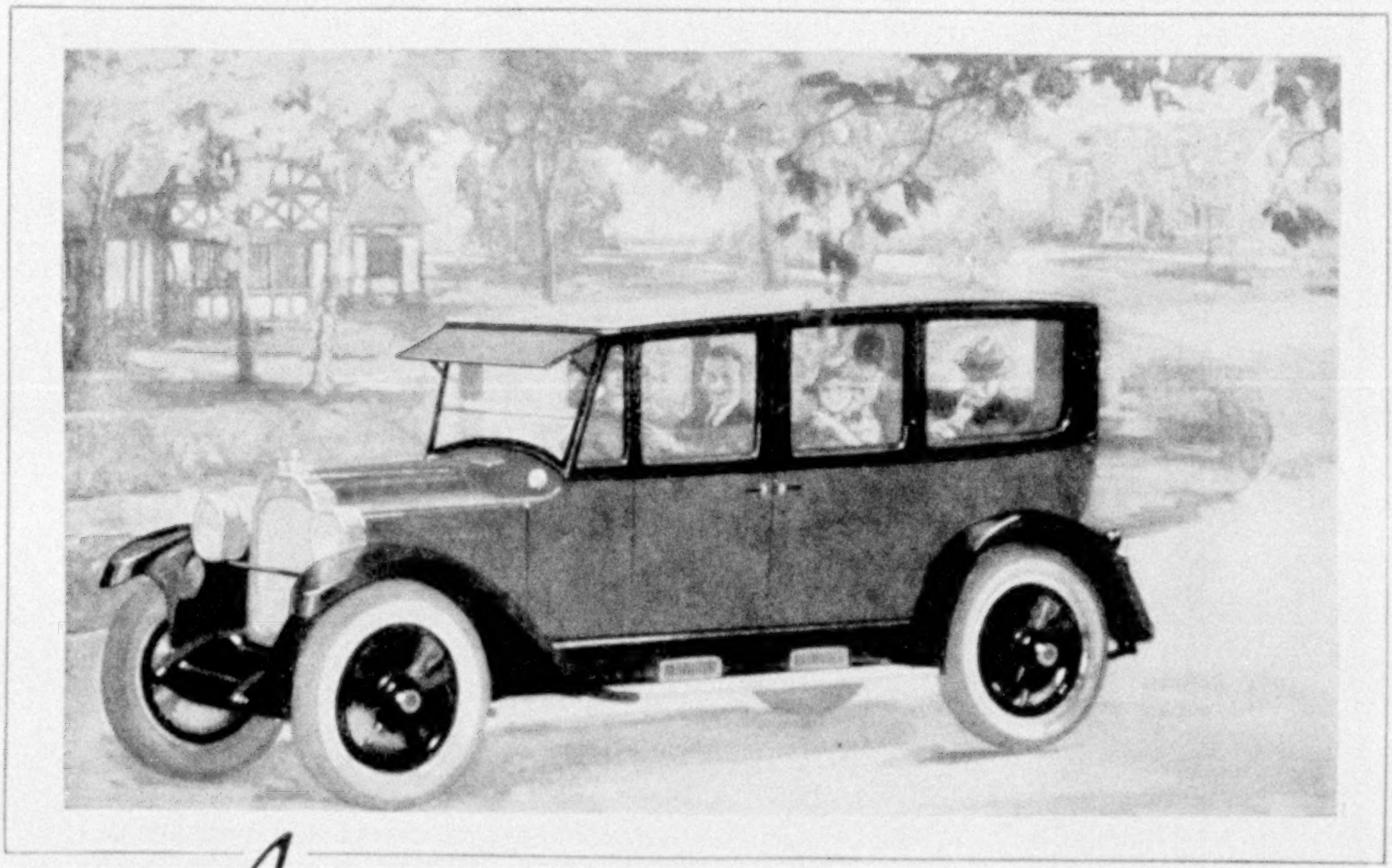
*S. S. "Logan," 13,500 Tons Displacement, 465.5 feet long; 49 feet wide.*
*School Term: Sept. 15, 1923, to June 20, 1924.*

## Unexcelled Educational Advantages 270 Days' Unsurpassed World Cruise

Only boys' school of its kind in the world. Last two years of High School and first two years of Liberal Arts College. Accredited by leading educational institutions. Strong faculty. Ideal conditions and facilities for study. Calls made at most interesting ports of both hemispheres. Interior excursions to Paris, war zones, "The Eternal City," Holy Land, Pyramids, etc. Noted institutions, libraries, museums, art galleries, palaces, cathedrals, capitals visited under the direction of faculty members and competent guides.

Ship noted for good behavior in all weather. Remodeled for floating school by naval and school architects. Free services of school surgeons, dentists, and nurses. Everything for students' welfare and happiness and for physical, educational, cultural, and moral development. Enrollment lists closed after acceptance of only 400 students. Write for complete information, tuition rates, etc.

CANDLER FLOATING SCHOOL COMPANY
1131-W Candler Building Atlanta, Georgia



# *Announcing*

A low-swung, smooth-powered Willys-Knight Seven-Passenger Sedan, spaced for generous comfort, and fully appointed.

Auxiliary seats fold into rear of front seats. Refinements include heater in floor, windshield visor and wiper, step light, and clock. Upholstery is richly done in broadcloth.

The Willys-Knight sleeve-valve motor actually improves with use. Owners report 50,000 miles and more without a single motor adjustment. To own a Willys-Knight is to realize every motoring expectation.

WILLYS-OVERLAND, INC., TOLEDO, OHIO

WILLYS-OVERLAND LIMITED, TORONTO, CANADA

# WILLYS-KNIGHT

## SEVEN PASSENGER

# When are you going to EUROPE?

IF you have been planning to go to Europe, send the information blank below today. Learn about the Government ships, which are operated between New York and Europe.

### *Make Your Plans Now*

Plan to avoid the general rush during June and July. Few people know the indescribable charm of Europe in late summer—in August and September—or in the early Spring—April and May.

Next sailings, of first class ships are:

***George Washington, April 14***
***President Roosevelt, April 21***
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In addition to these one of the famous cabin ships sails each Wednesday from New York.

### *Write Today For—*

*A Booklet of suggested tours, ranging from $495 up for a six 'weeks' trip; information about the chief events in Europe in Spring and Summer; a handsomely illustrated booklet showing exteriors and photographs of interiors of U. S. Government ships; full information about sailings, accommodations and rates.*

INFORMATION BLANK
To U. S. Shipping Board
Infor. Section E.C.S.S. 1554, Washington, D. C.

Please send me without obligation the U. S. Government literature described above. I am considering a trip to Europe ☐, to the Orient ☐, to South America ☐.

*My Name* ____________________

*Address* ____________________

*For information in regard to sailings address*

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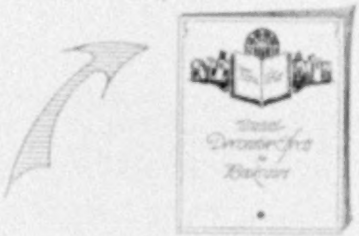
AND the beauty of it is that popular prices adorn these bookcases . . . They always express good taste. Their glass doors completely protect books from dust and dampness. And in any room in the house they are decorative . . . For your spring "pick-up," see Globe-Wernicke Sectional Bookcases now. They grow with your books, a real advantage . . . Popularly priced, everywhere!



*LET US HELP—we will gladly send our booklet of Unusual Decorative Effects for Bookcases. Address: Dept. B5-4 at Cincinnati.*

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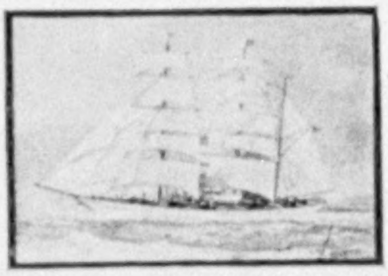

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saves mother's
time — and the
children enjoy
it, too
MOTHER's hands still find plenty to do in a house today even though she has the aid of many modern conveniences.
And one of these duties, pleasant enough perhaps, but how time-consuming, is the children's daily bath.
Here is where the shower saves time, for two minutes are enough for a bath. Then there is the cleanliness and the delight of bathing in running water. Children soon learn to take their own showers. Of course all the members of the family will enjoy the shower.
We will send anyone really interested, a book on shower bathing—styles and types of showers best adapted to various kinds of bathrooms are shown. The title is, "Once-Used Water."
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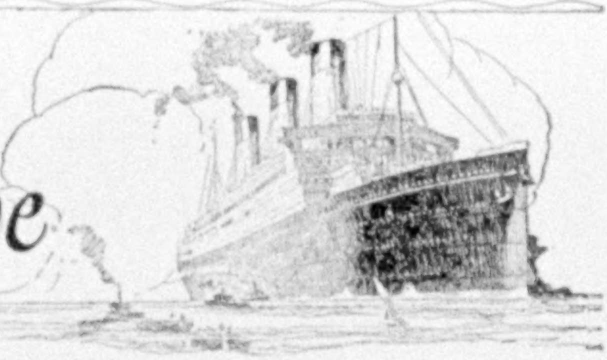

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**AMERICAN LINE** **RED STAR LINE**
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A GIFT THAT'S ALWAYS IN SEASON

Bowl turned out of wood, polished to bring out beautiful, natural grain, with handle to match. Holds two pounds of nuts. Powerful double acting jaws, heavily nickeled and polished. An ornament for any sideboard. Price $10.00 each, postpaid any point in U. S. or Canada.

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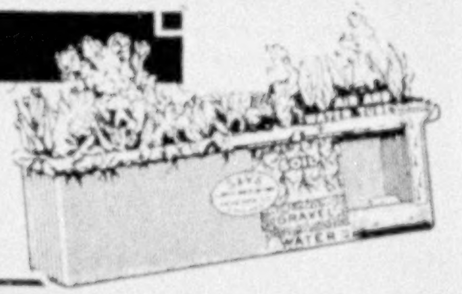
Savo Steel Boxes have sub-irrigating and self-watering features. They grow more beautiful flowers and sturdier plants. **ARTISTICALLY DESIGNED**—rolled rimmed and round cornered. Made of "Armco" Galvanized Iron. Six Sizes.

**ALL YEAR ROUND GARDEN**—An ideal flower box for windows, porches, sun-parlors, etc. Move indoor for plants during winter. **Leak-Proof—Rust-Proof—Durable.** Enamel finished inside and out, in Aluminum or Dark Green. Write for booklet



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*Whatever Your Question;*—be it the pronunciation of Bolsheviki, the spelling of a puzzling word, the location of Murman Coast—the meaning of blighty, ace, tank, ukulele, etc., this Supreme Authority—

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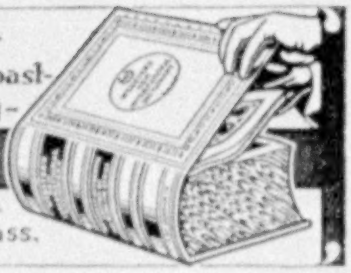

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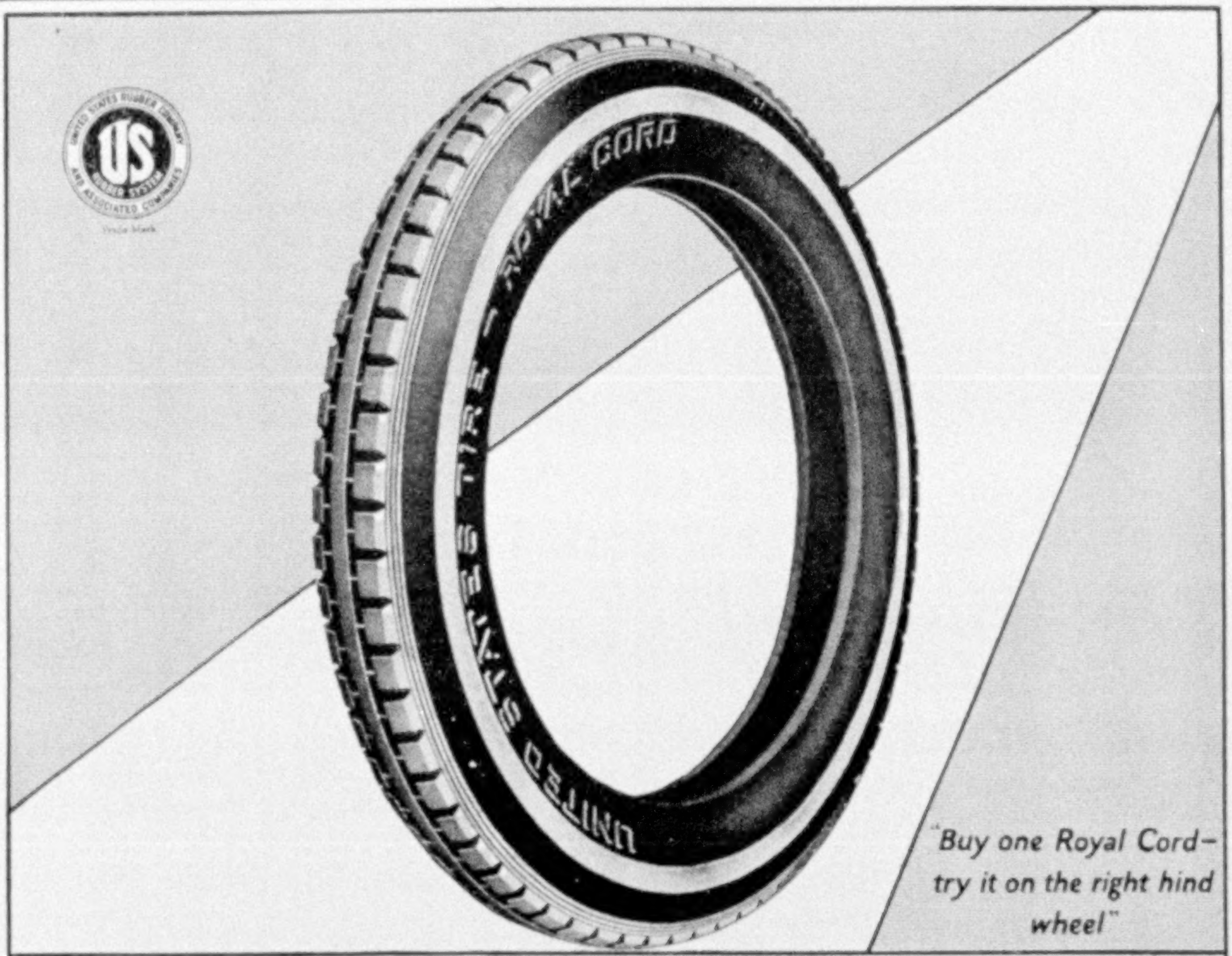


# To the new users of Royal Cords —probably a million in 1923

MOST rules are all the better for being broken once in a while.

There's an advertising rule, for instance—never to ask anyone to buy a thing and try it.

When the makers ask you to try a Royal Cord on your right hind wheel they may be breaking the rule, but you will benefit thereby.

The makers of Royal Cords, for their part, can't see why making friends should ever go out of fashion.

The more quality a tire has—and the more leadership—the greater its obligation to be simple and direct. Royal Cords earned their position of high regard by simple things.

You can easily see that people's confidence in Royal Cords could never have been won by quoting a lot of *big mileages*, talking *big* discounts, or going through all those other kinds of gestures with the idea of registering *big*.

The makers of Royal Cords devote themselves to guarding quality and have no desire to dazzle customers.

Their ideas seem to be right, because U. S. Royal Cords are the measure of all tire values today.

## United States Tires are Good Tires

© 1923, U. S. Tire Co., N. Y.

# The luxury and convenience of built-in accessories

WHETHER your home is elaborate or unpretentious, the keynote to real luxury and comfort will be found in the appointments of the bath.

Fairfacts China Accessories are built in the bathroom walls. They will endure as long as the structure itself, without staining or cracking. Their bright, fresh appearance, as the years go on, will be a perennial tribute to your judgment in making sure that genuine Fairfacts China Accessories were installed when you built your home.

Fairfacts Fixtures cover every need of the bath, Soap Holders, Towel Racks, Paper Holders, Tooth Brush and Tumbler Holders, Shelves and Electric Radiators, etc.

May we send you our booklet, *"The Perfect Bathroom."*

THE FAIRFACTS COMPANY, INC.
*Manufacturers*
Dept. N
234 West 14th Street, New York City

## Fairfacts Fixtures

BUILT IN YOUR BATHROOM WALLS

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At Auction

—and do you call it luck? The consistent winner may have the reputation of being lucky—but he doesn't trust to luck to win. His plays are based on scientific analysis. He understands the basic laws which govern all plays and follows them.

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By a national authority, Adair Foster, explains the basic principles of Auction as it is played today. It is conveniently arranged in six lessons, and gives all the established conventions of the game. Easy to read, it interprets in an understandable way the latest rules of Auction.

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ADAIR FOSTER

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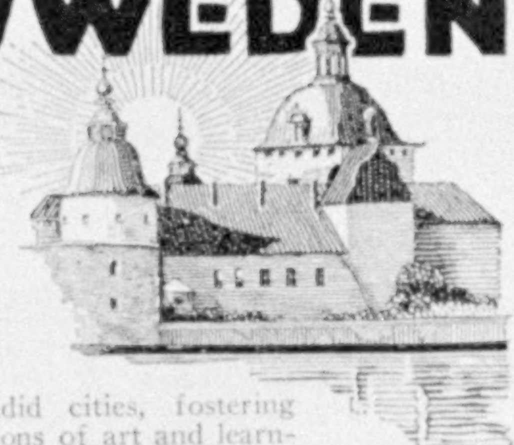
## SWEDEN



Splendid cities, fostering institutions of art and learning, in an architectural setting of unique beauty—picturesque old castles and medieval ruins—inspiring vistas of rugged landscape—delightful pictures of quaint, peasant life—and, in the far North, the wandering Lapp and his reindeer herds. Such is Sweden, land of myriad charms and courteous people. Go there this summer and take in the sights of the

**Gothenburg Ter-Centennial Exposition**
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*Official Representative of Swedish State Railways*
24 State Street, New York
Or any authorized tourist agency.

# Clemenceau's boundless energy is built on sound sleep

On his eightieth birthday, the busy "Tiger of France" said the secret of his unfailing youth and energy is *sound sleep*.

All successful men know that sleep is a faithful but exacting paymaster—that it will return many-fold all that you give it or make you pay dearly for any attempt to cheat it.

Knowing this, *why* do you give your sleep equipment so little thought? Why do you buy a spring and mattress with less attention than you give to any other necessity you purchase?

Take ten minutes tonight to study the mattress and spring you sleep on. Go to your furniture dealer's and examine the wide range of Simmons mattresses and springs offered at prices to fit any pocketbook.

Compare what you have with a Simmons mattress of buoyant *new* material and a Simmons spring of the type you like. Then judge for yourself whether health, energy and personal success are not worth more to you than the small cost of Simmons sleep comfort.

## SIMMONS

*Beds · Mattresses · Springs*

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## THE SWEETMEATS OF KINGS

*By Appointment* to *King George V.*

BISCUITS! Really confections—these crispy, luscious morsels of such smooth creaminess they fairly melt on your tongue.

With great confidence we offer this famous assortment, made by the unrivalled house of Huntley & Palmer, known thruout the world for their irreproachable products.

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## $425 will take you on a 30-day tour to Europe

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Other Gates Tours from $425 up to $1100 ranging from 30 to 80 days, are described in our booklet B-4. Sailings from May to September. **Apply direct to Gates Tours, 225 Fifth Avenue, New York,** or to Raymond & Whitcomb Co., General Agents in Chicago, Philadelphia, San Francisco and Los Angeles.

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Write for information about the Gates Cruise to the Mediterranean, sailing in February, 1924

## *Beautiful* TILES

Distinctive—serviceable—proper.

Offering unlimited opportunities for decorative expression in floors, walls, mantels, and window bench facings like the above, which is of Faience Grilles.

The practical advantages of Tiles for the bathroom and kitchen are enhanced by the fact that in such use, as in other parts of the house, any desired effects in color, texture and treatment may be had.

*Consult your architect and dealer about Tiles, or write to*

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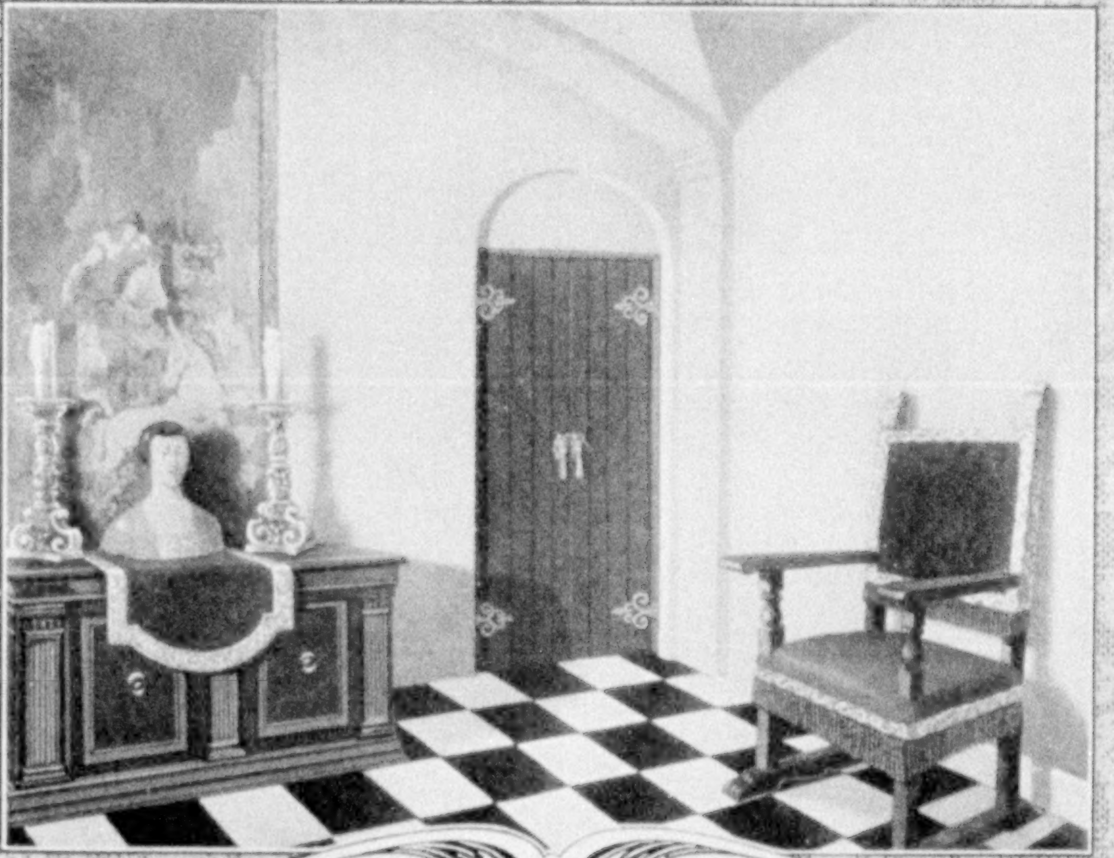


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Wall effects of the utmost in beauty, economy and durability can be procured with the least effort and disorder, by the use of

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Whether you wish to clothe your walls with colorful decorative patterns, or in flat, plain tints stippled, stenciled, blended, or frescoed, you can obtain, with Sanitas, just the effect desired; and a damp cloth will keep it clean and fresh.

Sanitas is made on cloth, and does not crack, peel, blister, or fade. Can be applied on new or old walls; cracks, properly treated, will not show through.

Sanitas comes in "styles for every room in the house"; decorative and floral patterns, flat-finish plain tints, and enamel-finish plain colors and tile and mosaic effects. Every style will prove an investment of lasting beauty and value.

*Have your decorator show you Sanitas.*
*Write us for samples and booklet.*

THE STANDARD TEXTILE
PRODUCTS CO.
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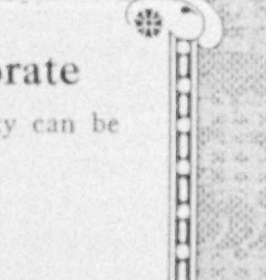

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**The Gladiolus** is one of the most satisfactory flowers grown, and there is no reason why every family cannot enjoy this grand flower—it is as easy to grow as the potato.

Bloom from July to frost if you plant a few bulbs each month from April to July.

For **Two Dollars** we will send **50 Bulbs** of our **Grand Prize** Mixture, which covers every conceivable shade in the Gladiolus kingdom.

Each year we sell thousands of these bulbs and have received numerous testimonials as to their merits.

**Order Your Bulbs Now,** so as to have them to plant when you begin making your garden.

*Simple cultural directions with every package*

Mail this advertisement with check, money order, cash, or stamps, and secure this splendid collection, sent prepaid to any point in the U. S. east of the Mississippi. **For points West and Canada, kindly add 25c. to cover cost of delivery.**

*Our 25th Anniversary Seed Annual sent on request*

Stumpp & Walter Co

**30 and 32 Barclay Street** **New York**

*The Book of Beautiful Homes*

YOUR new home will probably be the greatest investment of your life. Plan it well. Satisfy yourself before you build that all materials used in its construction will afford the utmost comfort per dollar in the years to come.

We have just published a new edition of our book "Natco Homes", illustrated with photographs and floor plans of attractive, economical homes built of Natco Hollow Tile. This book will make your planning easier, and it's free—to prospective home builders. Write for it today.

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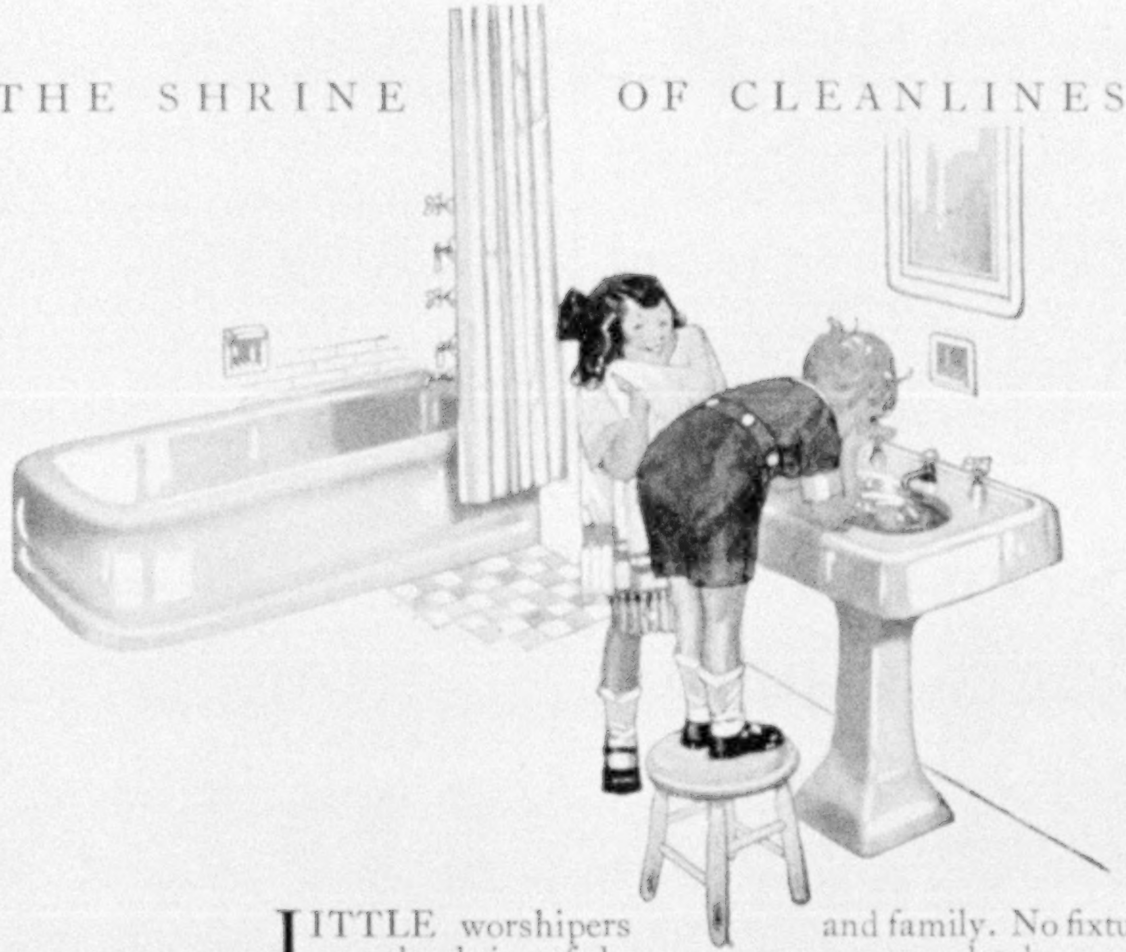
**NATCO**
HOLLOW TILE

THE SHRINE OF CLEANLINESS



LITTLE worshipers at the shrine of cleanliness, performing their devotions with soap and brush and towel.... learning unconsciously, as Youth always learns best, the lesson that will serve them all their lives....

What better school can they attend than the modern bathroom? And what stronger urge can one have to make the bathroom the finest room in the house?

To have such a bathroom, fitted with Kohler Ware, is to realize a deep-seated ideal of what is due to self and family. No fixtures more completely express the present-day standard of worth and beauty in bathroom equipment.

In every city there are good plumbing dealers who have known Kohler quality for years. Let them show you how a moderate investment will transform your old bathroom into the bathroom you have pictured—or how a surprisingly small space will suffice for the *extra* bathroom you have long desired.

May we send you our booklet of Kohler Ware for bathroom, kitchen and laundry?

Every piece of Kohler Enameled Plumbing Ware is exclusively distinguished for (1) the beautiful, snowy whiteness of its durable enamel (2) the uniformity of this whiteness in every fixture (3) the name "Kohler" in dainty blue letters inconspicuously but permanently fused into the enamel for your protection

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BRANCHES IN PRINCIPAL CITIES

MANUFACTURERS OF ENAMELED PLUMBING WARE AND KOHLER AUTOMATIC POWER AND LIGHT 110 VOLT D. C.

# Send the Coupon
*for free estimate*

**Chamberlin Metal Weather Strip Co., Detroit, Mich.**

Tell me the cost of equipping my building with Chamberlin Metal Weather Strips (check whether home, factory, office building, church, school).

*Give number of outside* *doors*__________ *windows*__________

*Name*____________________

*Address*____________________

*City and State*____________________

Eng. Dept. A-5

# Save Fuel
# Keep Warm
# End Draughts

You will be surprised at the small cost of equipping your home or business building with Chamberlin Metal Weather Strips.

And they add so much to comfort, cleanliness and good household economy. They save 25% to 40% of fuel costs. Keep dirt, dust, soot and smoke from sifting in. That ends one of the most tedious tasks of housework.

**Why Heat Your Building 36 Times Every Day?**

Tests show the inrush of cold air at unprotected windows and doors fills the average building 36 times daily. Why fight this with fuel?

How much more simple to bar it out as thousands of good home managers do, with Chamberlin Metal Weather Strips.

At 12,000,000 windows and doors Chamberlin Metal Weather Strips permanently end fuel waste and discomforts resulting from draughts. They make homes dust-proof. Protect hangings, furnishings and decorations. End rattling doors and windows.

**Healthier homes result.** Children are safe from cold air currents. No cold spots. You are not driven from the bright, cheerful window by chill draughts.

**Free** Chamberlin Strips are used on 85% of all weather stripped buildings, including homes, banks, schools, office buildings, churches, stores, hotels and apartments.

They are guaranteed to last as long as the building. Any need for service or attention, no matter how many years hence, is cheerfully done free, by Chamberlin experts. An estimate by our engineering department, on the cost of your equipment, is free. Just send the coupon.

**CHAMBERLIN METAL WEATHER STRIPS**
"SINCE 1893-THE STANDARD"

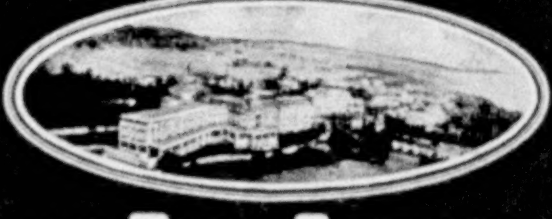
Even on grounds of an acre or less, Ideal Power Mowers quickly pay for themselves. The fact that they cut and roll such lawns in little more than an hour enables owners to save many dollars in labor each season.

Your caretaker or an unskilled laborer can do perfect work with an Ideal. The mechanism is simple and fool-proof. No high-wage help is required.

Write for our interesting literature on lawn care.

**Ideal Power Lawn Mower Co.**
*R. E. Olds, Chairman*
422 Kalamazoo Street — Lansing, Michigan
New York, 13-19 Hudson St. — Chicago, 11 E. Harrison St.
*Dealers in all Principal Cities*

# IDEAL
(30)
## Power Lawn Mowers



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WATKINS GLEN, N. Y., ON SENECA LAKE
*Open All The Year Wm. E. Leffingwell, Pres.*
**The pioneer American "cure" for Heart Disorders with all advantages of European Spas.**

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# EUROPEAN TOURS

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SUMMER TOURS COMMENCING MAY 26
of from fifty-three to ninety days' duration, embrace all the interesting spots of Europe.

**Cost varying from $615.00**

*Descriptive booklet G-3 on request*

## McCANN'S TOURS, INC.
*Since 1876*
Marbridge Building, 1328 Broadway
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PITCAIRN

# Water Spar

## Varnish

WATERPROOF
*and* SOLEPROOF

*This test is proof positive that water will not turn this varnish white—or in any way injure the coated surface.*

## *Dripping, sloshing feet that tramp your floors*

EVERY drop they leave tests out your varnish. Ordinary varnish will whiten and peel. Its luster will be destroyed, its protective qualities ruined.

That is why it is such positive protection and economy to use Pitcairn Waterspar Varnish on your floors, woodwork and furniture.

Waterspar Varnish is absolutely impervious to water. It never turns white. Boiling water will not harm it. It covers the surface with a smooth, rich, durable finish that even ruthless heels can't mar. Its fine luster remains undimmed through usage that would ruin ordinary varnishes.

Besides the transparent Waterspar, there is also Waterspar Colored Varnish and Enamel. Eighteen attractive colors—all free-flowing and easy to apply. Remarkably wear-resisting. Waterproof, too.

In addition to the Pitcairn Waterspar Varnishes many other famous products are manufactured by the Pittsburgh Plate Glass Company—each known for high quality and perfect service. No matter what you require in the way of glass, paint and varnish products, the Pittsburgh Plate Glass Company manufactures something that will meet your needs *exactly*. Handled by quality dealers everywhere. Remember—a good brush is as essential as good paint.

*Write for "Proof" Booklet.*

OUR PAINT AND VARNISH ADVISORY BOARD *will gladly consult with any manufacturer facing a paint or finishing problem and render recommendations without obligation. Booklet on request.*

# PITTSBURGH PLATE GLASS CO.

GLASS - Manufacturers - PAINT

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*-------------------------------192*

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*Sixteenth and M Streets Northwest, Washington, D. C.:*

*I nominate* ----------------------------------------------------------

*Occupation* ----------------------------------------------------------
(This information is important for the records.)

*Address* ----------------------------------------------------------

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4-23 *Name and Address of Nominating Member*

A. F. B. A. HOUSE No. 628
*at Park Ridge, Illinois*

This is one of the ninety-six attractive designs shown in "Face Brick Bungalow and Small House Plans"

# Basic Values in Home-Building

FACE Brick combines that strength, durability and beauty which meet the requirements of both good taste and the thrifty purse. Other materials have their merits and make their appeal, but looking at the home-building problem on all sides, no other material approaches Face Brick in the structural and artistic values it offers — permanence, comfort, safety from fire, economy, and beauty. Every home-builder will find it worth while to investigate Face Brick before he builds. The facts are given in "The Story of Brick." For your copy, address American Face Brick Association, 1737 Peoples Life Building, Chicago, Illinois.

## Send for these booklets:

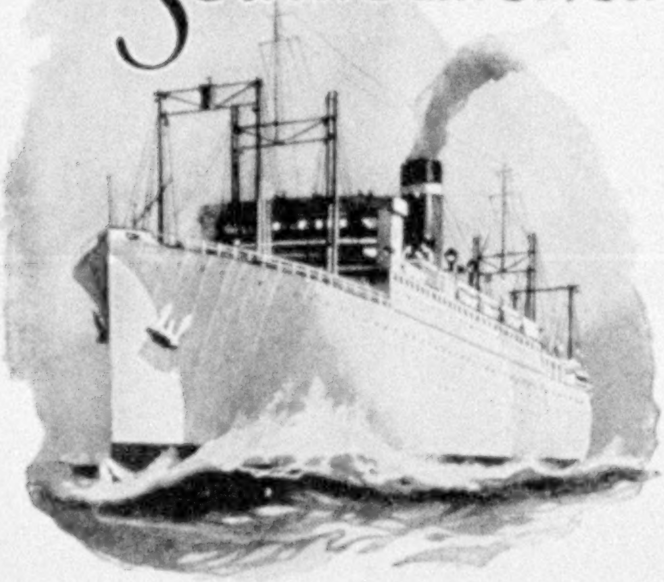
***"The Story of Brick"*** is an attractive booklet with beautiful illustrations of modern homes, and discusses such matters as Comparative Costs, Basic Requirements in Building, the Extravagance of Cheapness, Financing the Building of a Home, and kindred subjects. A copy will be sent free to any prospective home-builder.

***"Face Brick Bungalow and Small House Plans"*** embrace 96 designs of Face Brick Bungalows and small houses. These houses are unusual and distinctive in design, economical to build, and convenient in floor plan. "Face Brick Bungalow and Small House Plans" are issued in four booklets, showing 3 to 4-room houses, 5-room houses, 6-room houses, and 7 to 8-room houses. The entire set for one dollar; any one of the books, twenty-five cents. We can supply complete working drawings, specifications and masonry quantity estimates at nominal prices.

***"The Home of Beauty"*** contains fifty designs of Face Brick houses, mostly two stories, representing a wide variety of architectural styles and interior arrangements. These houses were selected from 350 designs submitted in a nation-wide Architectural Competition. Sent for 50 cents. We also distribute complete working drawings, specifications and quantity estimates for these houses at nominal cost.

***"Orienting the House"*** is an illustrated booklet, with a sun dial chart and explanation for placing the house with reference to light and shade. Sent for 10 cents.

# 4 Sister Ships to South America



If you have not yet done so, investigate now the claims made for the four white sister ships of the U. S. Government fleet to South America! Experienced travelers maintain them to be the "finest and fastest ships on the run."

The four new 21,000 ton oil-burning vessels are:

| | | |
|---|---|---|
| *Western World | sailing | April 14 |
| Southern Cross | sailing | April 28 |
| American Legion | sailing | May 12 |
| *Pan America | sailing | May 26 |

*Stops at Santos on Southbound run.

They go to Rio de Janeiro in less than 12 days!—a record on the run! The ships, operated by the Munson Steamship Lines, sail every fortnight from New York. They go to Rio de Janeiro, Montevideo and Buenos Aires.

If you are planning an ocean trip, write now for the Government's valuable travel information. You incur no obligation.

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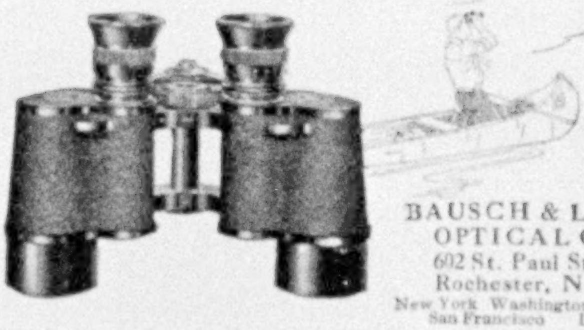

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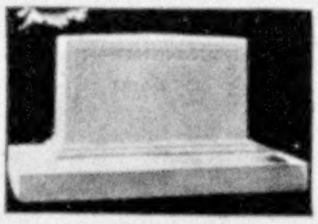

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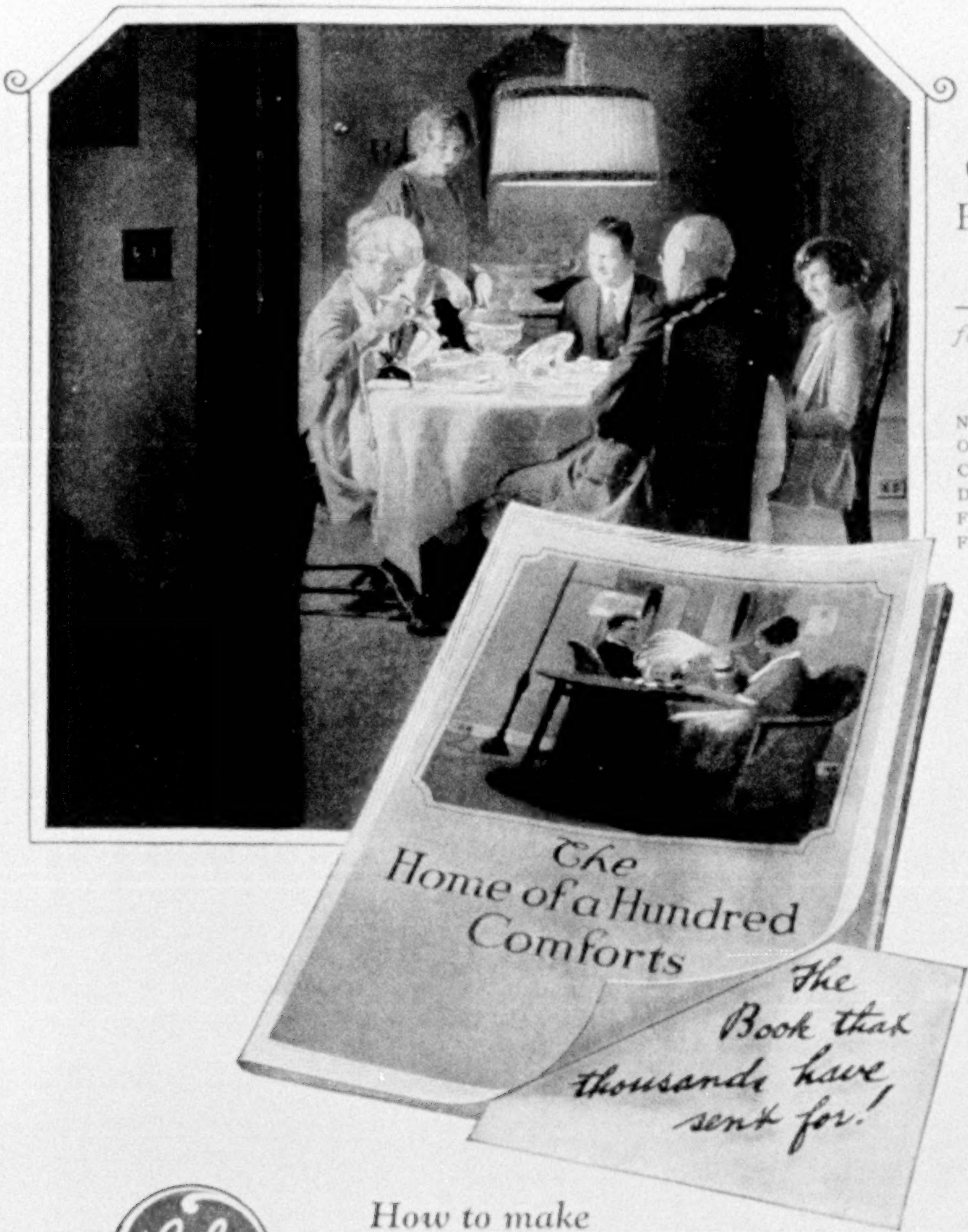


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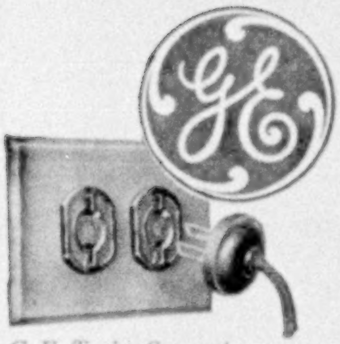

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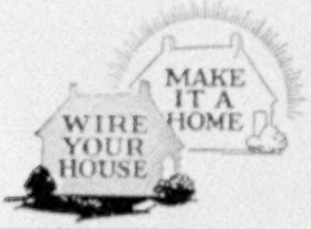


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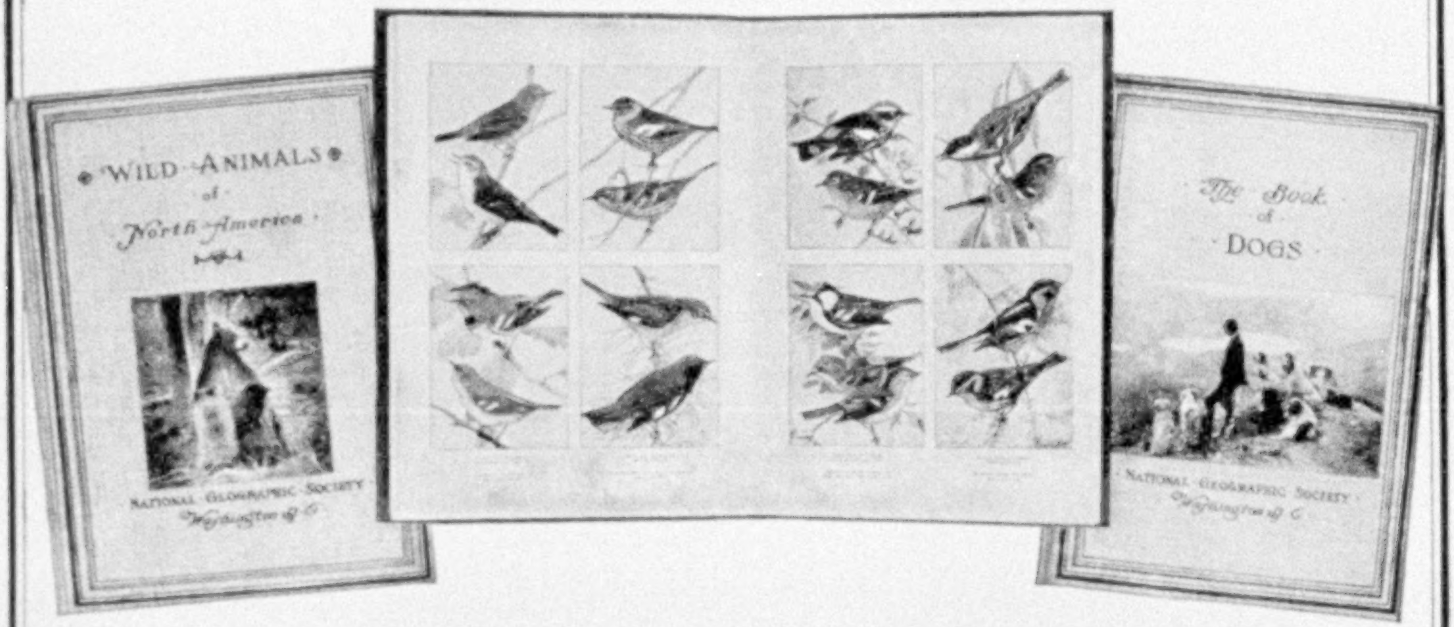


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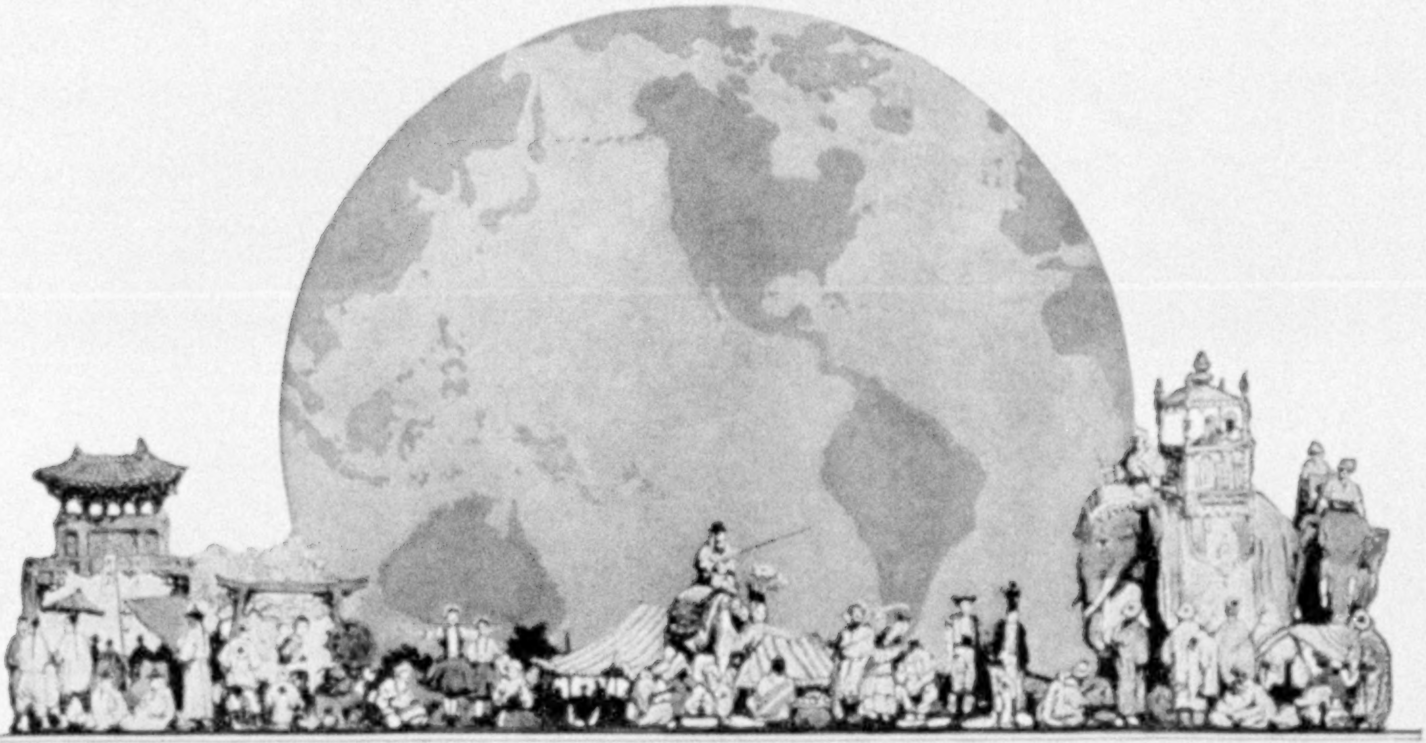

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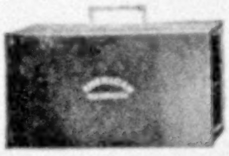

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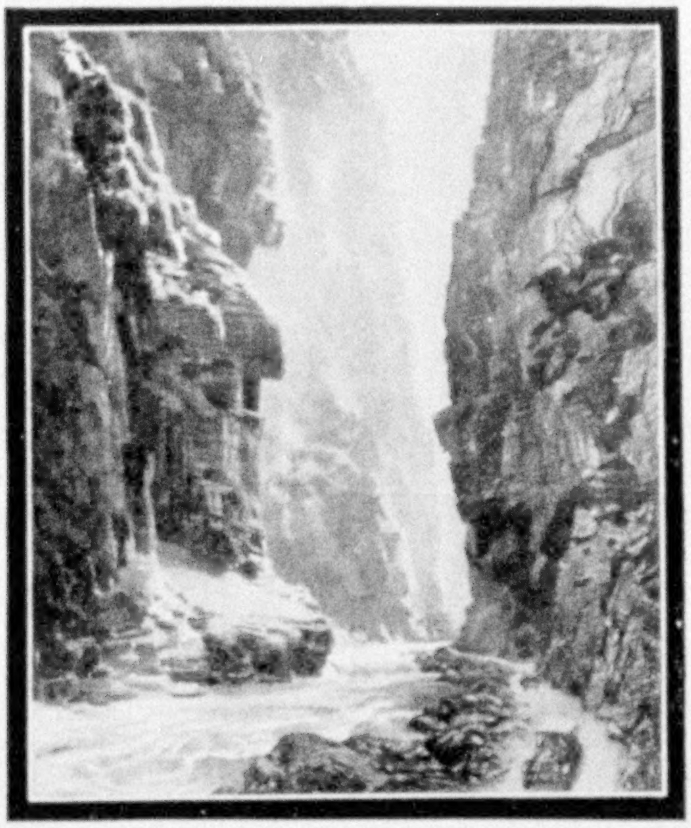

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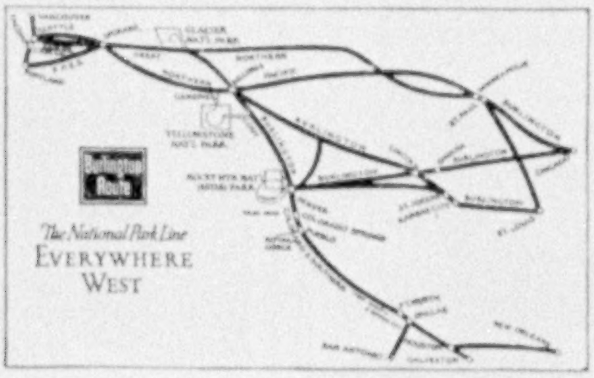


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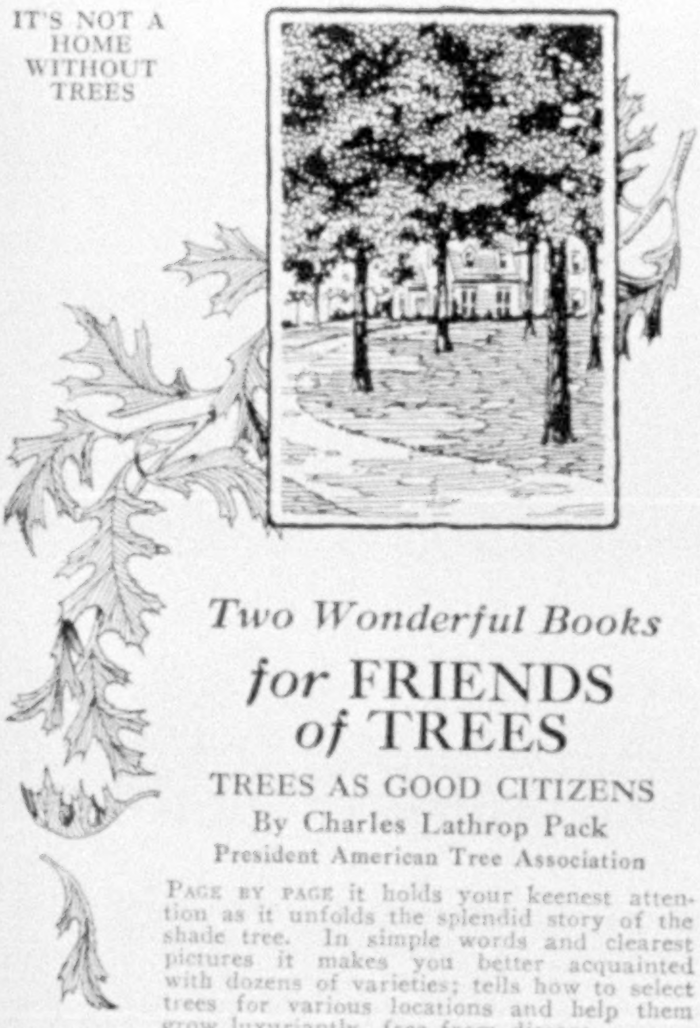

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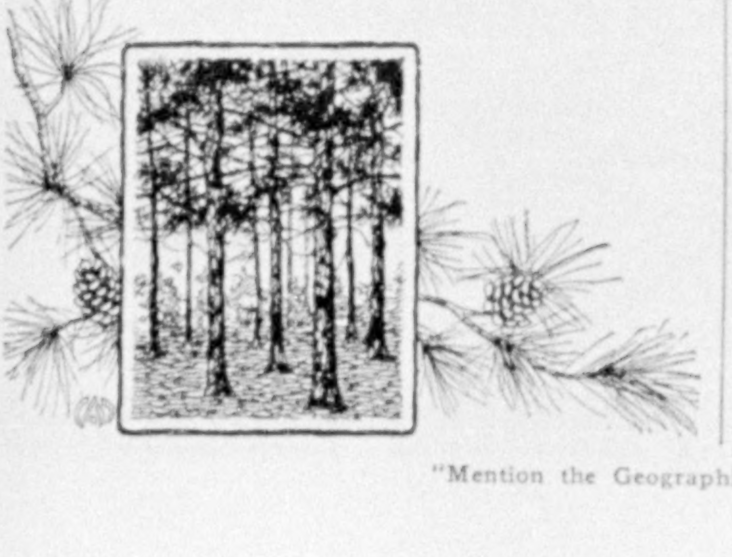

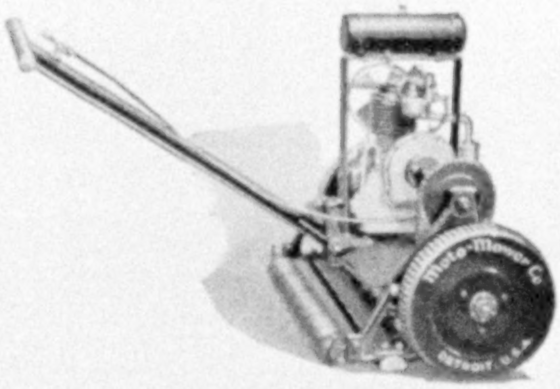

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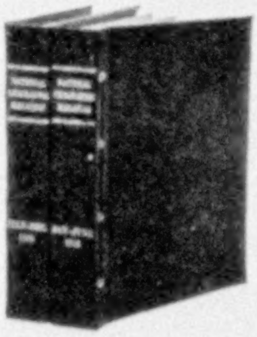

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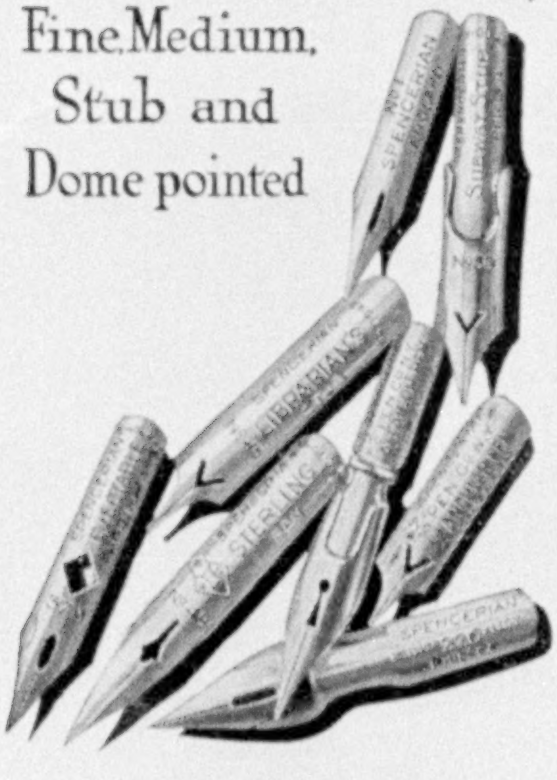

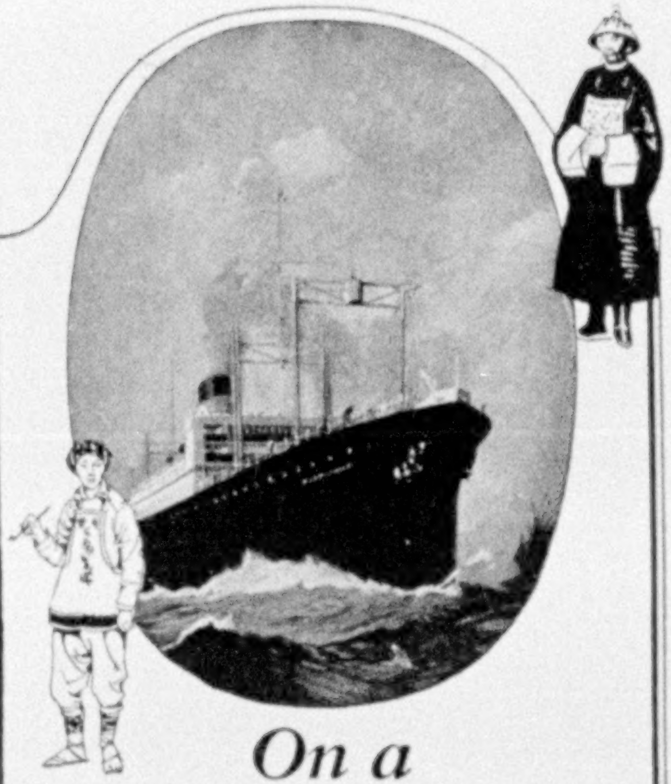

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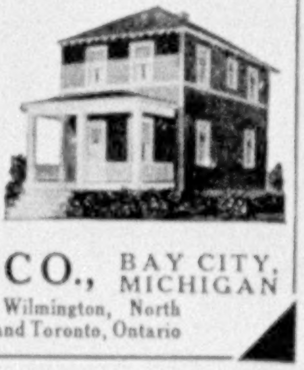

Highest grade lumber for all interior woodwork, siding and outside finish.

**Send today for money-saving Aladdin Catalog No. 2342.**

**The ALADDIN CO.,** BAY CITY, MICHIGAN

**Also Mills and Offices at Wilmington, North Carolina; Portland, Oregon; and Toronto, Ontario**

# Virgin Market for Certain Advertisers

*To Real Analysts of Advertising:*

Study of the advertisers in THE GEOGRAPHIC will reveal these special opportunities:

> **A virgin field** for many products and services for which our 750,000 Solid Subscriber Families are a logical market.
>
> **Under-competition** rather than over-competition in many lines where there is still plenty of room for various products; a thought for those who are not mere "follow-my-leaders" in advertising.
>
> **An opportunity** to associate a product with other prestige products, safeguarded from accidental juxtaposition with flashy or unpleasant advertising which non-selective advertising often compels.

By accepting only a limited number of pages of advertising and through its policy of admitting only advertisements of real interest to readers, THE GEOGRAPHIC gains maximum concentration of attention for each advertisement it does accept—this is a time-proved fact.

To maintain this policy, THE GEOGRAPHIC declines thousands of dollars of space for every issue. Some is rejected because it is deemed unreliable or unpleasant in tone, but most is refused because it would not be of direct interest or service to its 750,000 subscriber families. Conversely, no advertisement is accepted unless we feel that it has an excellent chance, because of applicability to readers, of paying the advertiser. We are as loath to waste an advertiser's money as we are to waste our reader's time—strange yet true.

As a result, every line of our advertising is coupled to high-grade products or services. Our advertisers constitute a group with which any business man would be proud to be associated and with which our readers can deal with unhesitating confidence.

That our 750,000 reader families do read GEOGRAPHIC advertisements—in a more intensive way—is proved by the results our advertisers report. In the interest of your product, ask us *today* about these results.

NATIONAL GEOGRAPHIC MAGAZINE
WASHINGTON, D. C.


XUM

# A Garden Full of Dahlias for $3.50

**New and Rare Exhibition Dahlias**

Few flowers, whether used for garden decoration or principally for cut blooms to decorate the home, are as responsive to simple garden culture as our Modern Dahlia. It has made wonderful advancement in size of bloom, habit of growth and profuse blooming qualities.

In order to further its now great popularity, we are offering this collection of

**12 Dahlia Tubers for $3.50**

—one each of 12 distinct varieties, not labelled, which if purchased separately according to name would cost not less than $10.

**Order Your Tubers Now** so as to have them ready to plant any time after the tenth of May or when all danger of frost is past.

Mail this advertisement with check, money order, cash, or stamps, and secure this exceptional collection, sent prepaid to any point in the United States.

*Our 25th Anniversary Seed Annual sent on request*

Stumpp & Walter Co

30 and 32 Barclay Street New York

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# DREER'S GARDEN BOOK 1923

THE most complete catalogue of Seeds and Plants published—an invaluable guide to both amateur and professional gardeners. A large book of 224 pages with 8 color plates and hundreds of photo-engravings of the latest novelties and standard varieties. Filled with cultural information compiled from DREER'S 85 years' experience and advice from famous experts.

It offers the best Vegetable and Flower Seeds, Lawn Grass and Agricultural Seeds, Garden Tools and Implements, Fertilizers, Insecticides, etc. Also Plants of all kinds, including the newest and best Roses, Dahlias, Hardy Perennials, Garden and Greenhouse Plants, Bulbs, Hardy Climbers, Hardy Shrubs, Water Lilies and Aquatics, Small Fruits, etc.

*Write today for a copy, which will be mailed free if you mention this publication.*

HENRY A. DREER 714-716 Chestnut Street Philadelphia, Pa.

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For Finest Residences, Clubs, Yachts, and for

GENERAL PRESENTATION PURPOSES

The 8-day, High-Grade, World-Renowned

# "CHELSEA" CLOCKS

MANTEL, BOUDOIR, SHIP'S BELL, AUTO, AND YACHT

In bronze metal and mahogany (period) cases. Cost more than others, but the value is there. All others are comparative. ASK any USER.

On sale by high-class jewelers in chief cities

Chelsea Clock Co., 10 State St., Boston, Mass., U.S.A.

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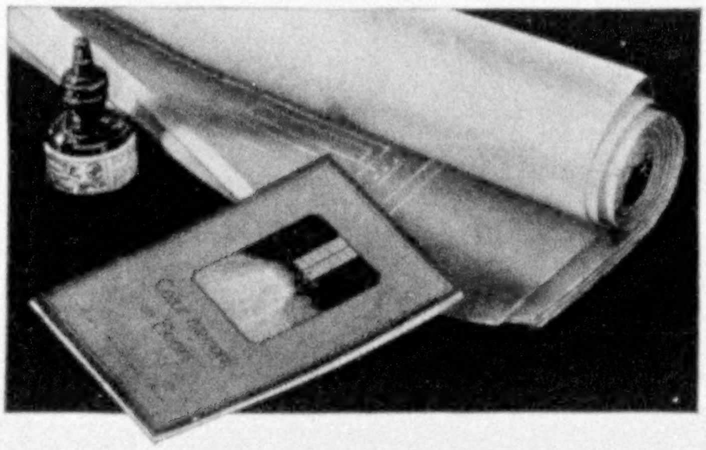

# "Color Harmony"

*—the newest opportunity in flooring*

Do you know how to harmonize the color of your floors with the color scheme of your walls, your woodwork, your tapestries, drapes or furniture?

Do you know how to reflect the spirit and the purpose of the room by the color of the flooring—what flooring will best take a walnut or mahogany stain—what color you get in waxed or varnished Maple, Beech or Birch?

"Color Harmony in Floors" is an interesting opportunity for the expression of individual character in the home—and a subject of equal importance to the builder of a modern club, hotel, apartment or other structure calling for beauty in floors.

The new book, "Color Harmony in Floors," will reveal new decorative possibilities to you. You may secure a copy through your local lumber dealer, or write to us, and we will gladly mail a copy to you with our compliments.

MAPLE FLOORING MANUFACTURERS ASSOCIATION
1044 Stock Exchange Building, *Chicago*

*Guaranteed Floorings*

The letters **MFMA** on Maple, Beech or Birch flooring signify that the flooring is standardized and guaranteed by the Maple Flooring Manufacturers Association, whose members must attain and maintain the highest standards of manufacture, and adhere to manufacturing and grading rules which economically conserve every particle of these remarkable woods. This trademark is for your protection. Look for it on the flooring you use.

**MFMA**

# Floor *with* Maple
## Beech *or* Birch

# Deaf Can Hear Says Science

## New Invention Aids Thousands

Here's good news for all who suffer from deafness. The Dictograph Products Corporation announces the perfection of a remarkable device which has enabled thousands of deaf persons to hear as well as ever. The makers of this wonderful device say it is too much to expect you to believe this so they are going to give you a chance to try it at home. They offer to send it by prepaid parcel post on a ten-day free trial. They do not send it C. O. D.—they require no deposit—there is no obligation.

They send it entirely at their own expense and risk. They are making this extraordinary offer well knowing that the magic of this little instrument will so amaze and delight the user that the chances of its being returned are very slight. Thousands have already accepted this offer and report most gratifying results. There's no longer any need that you should endure the mental and physical strain which comes from a constant effort to hear. Now you can mingle with your friends without that feeling of sensitiveness from which all deaf persons suffer. Now you can take your place in the social and business world to which your talents entitle you and from which your affliction has, in a measure, excluded you. Just send your name and address to the Dictograph Products Corporation, 1311 Candler Building, New York, for descriptive literature and request blank.

*It cleans where you can and cannot see*

Sprinkle Sani-Flush into the toilet bowl. It removes all discolorations. The porcelain gleams. No scrubbing, no scouring!

Sani-Flush cleans the hidden, unhealthful trap. Destroys all foul odors. Will not harm plumbing connections. Just sprinkle Sani-Flush into the bowl. Follow directions on the can, and flush. Keep Sani-Flush handy in the bathroom.

*Buy it at grocery, drug, hardware, plumbing and house-furnishing stores. Price, 25c.*

THE HYGIENIC PRODUCTS CO., Canton, Ohio

*Foreign Agents:* Harold F. Ritchie & Co., Ltd., Toronto, Canada
33 Farringdon Road, London, England; China House, Sydney, Australia

**Sani-Flush**

Reg. U.S. Pat. Off.

Cleans Closet Bowls Without Scouring



## MOTOR SERVICE DE LUXE

*For England and the Continent*

Leave the beaten paths! Private cars. Expert chauffeur guides. Itineraries suggested by our travel experts, or arranged to order. All details of trips managed for traveler. Inclusive rates for trips or cars for hire any period. An economical and delightful way to travel—much less expensive than bringing your own car, and equally luxurious. Write for Booklet 13 with Maps.

PRIVATE CONDUCTED TOURS

Limited parties—expert leadership—attractive rates. Also independent tours arranged. Send for Booklet 14 "Your Tour to Europe.

**FRANCO-BELGIQUE TOURS CO., Ltd.**

*An American Company* 1474 Broadway, New York

London Paris Brussels Rome



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JUDD & DETWEILER, INC.

Master Printers

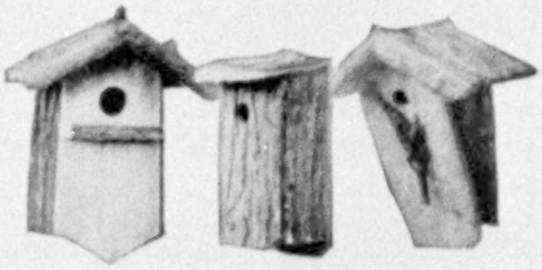
ECKINGTON PLACE AND FLORIDA AVE.

WASHINGTON, D. C.



## Rustic Cedar Bird Houses

Any three for $5.00. Parcel Post weight of three 10 lbs. An investment in Crescent Bird Houses will add to the value of your estate. The Birds will more than repay you by keeping your trees and shrubbery free from destructive insects.

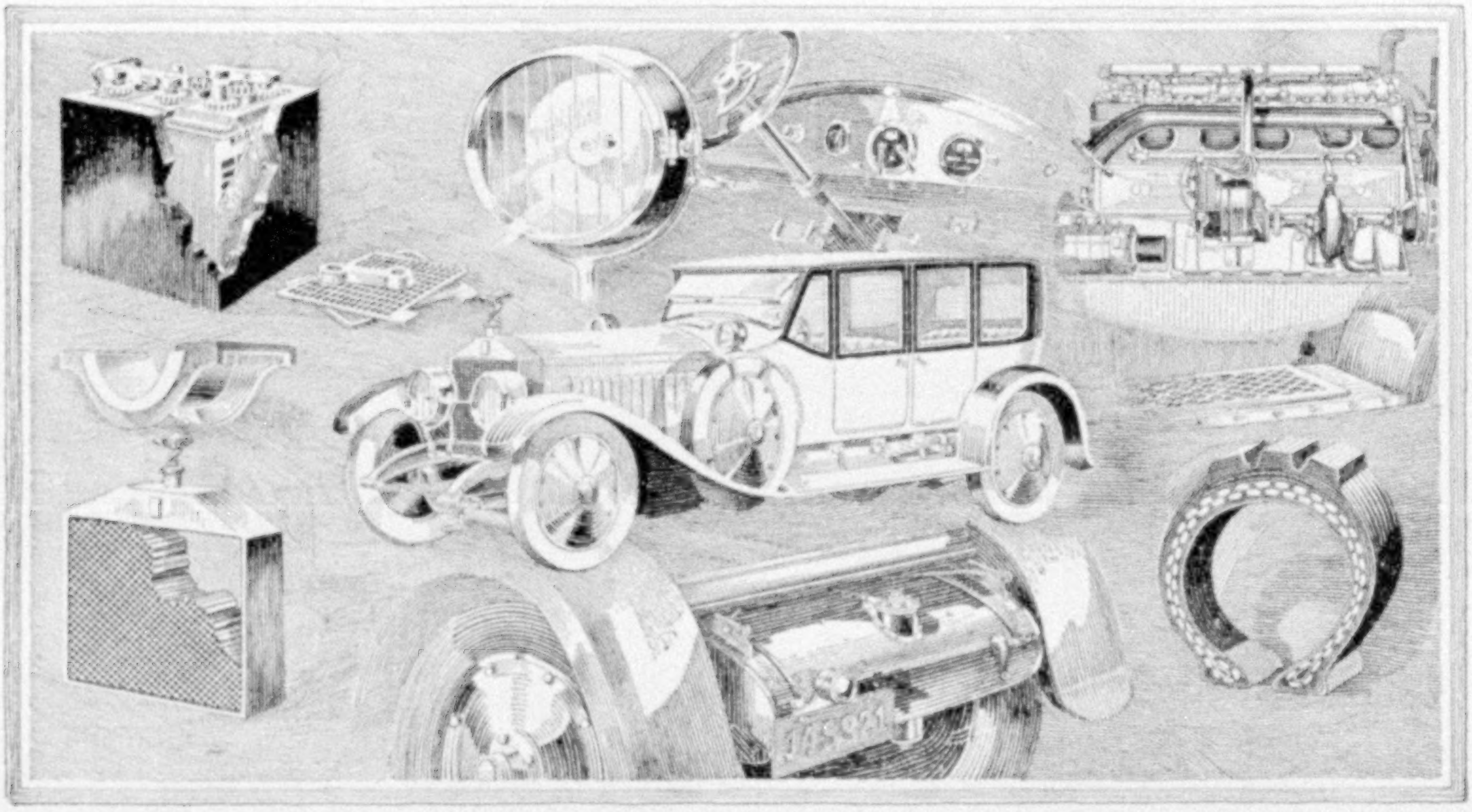


CRESCENT CO. "Birdville" Toms River P. O., N. J.



The Pro-phy-lac-tic Tooth Brush

Earned its reputation by "mouth to mouth" advertising



# What lead does in a motor car

SUPPOSE you took the lead out of your motor car. It might run—a few blocks—but with difficulty and inconvenience. In the first place, without the lead storage battery you would have to start it with a crank, and for lights you would have to return to gas or oil. You would have to carry your gasoline in a bottle; for, with the lead-tin solder out of the gas tank, the seams would leak, and for ignition you would have to return to dry cells.

### *Lead in the radiator*

After you had run a short distance, the motor would be so hot without your lead-tin soldered radiator that you would come to a stop. A good thing, too, for without the lead storage battery you could not blow the horn.

As a matter of fact, without lead you wouldn't have any gasoline to carry in a bottle; for litharge, an oxide of lead, is used in refining the gasoline that makes the automobile go.

### *Lead in the storage battery*

The storage battery which starts the motor, blows the horn, and provides current for the car lights is practically all lead. It contains lead in three forms. Red-lead and litharge, both oxides of lead, are spread as a paste on perforated hard lead plates. The hard rubber container in which the plates are immersed in sulphuric acid has lead in it.

### *Lead toughens the tires*

You cannot see the lead that is in the tires. But it is there. Lead oxides, added to the rubber at the time it is made, insure a uniform cure and give toughness to the rubber.

Lead is also in the soft rubber insulation around electrical wiring and in the hard rubber electrical devices and switch buttons. The rubber mat on the car step contains lead. The electric light bulbs are made of superior lead glass because of its great heat resistance and brilliancy.

"Save the surface and you save all"

### *The protection paint gives*

But none of these uses of lead are as widespread as that of white-lead in the manufacture of good paint. Not only the paint that protects the motor car, but all good paint wherever used contains white-lead.

Buildings unpainted crumble from decay. Buildings protected with good paint withstand time and weather. "Save the surface and you save all" is a maxim wise men are heeding. And the more white-lead any paint contains, the greater is its protecting power and durability.

### *Look for the Dutch Boy*

NATIONAL LEAD COMPANY makes white-lead and sells it, mixed with pure linseed oil, under the name and trademark of *Dutch Boy White-Lead*. The figure of the Dutch Boy you see here is reproduced on every keg of white-lead and is a guarantee of exceptional purity.

Dutch Boy products also include red-lead, linseed oil, flatting oil, babbitt metals, and solder.

Among other products manufactured by National Lead Company are lead tubing, sheet lead, soldering flux, lead pipe, bar lead, litharge, and lead plumbing materials.

### *More about lead*

If you use lead, or think you might use it in any form, write to us for specific information.

---

**NATIONAL LEAD COMPANY**

New York Boston Cincinnati San Francisco
Cleveland Buffalo Chicago St. Louis

JOHN T. LEWIS & BROS. CO., Philadelphia
NATIONAL LEAD & OIL CO., Pittsburgh

The LaFayette is built for those who know the economy of quality—of paying a little more at first and saving a great deal in the end.

For the exacting workmanship and the superlatively fine materials entering the manufacture of our car endow it with the enviable quality of keeping young.

Isn't it worth a little more to know that long after the accepted span of automobile usefulness the LaFayette you buy today will be delivering capable, uninterrupted service?

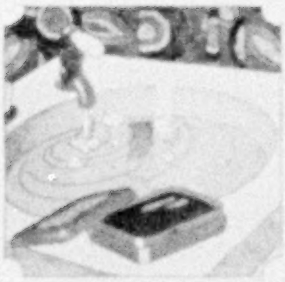
LaFayette Motors Corporation
Milwaukee, Wisconsin

LaFayette

XUM

# Its New Metal Container!

*Beautiful hair and white bathrooms welcome PACKER'S in this new form*



You can now give your hair the immediate and lasting benefits you know you can get from Packer's—with greater comfort and speed. The new metal box makes Packer's the handiest kind of a shampoo and bath soap imaginable. Here is your chance to have your own individual cake, to put away when not in use.

Every time you wish to use your Packer's it's just where you want it and the *way* you want it—in its own particular box, kept fresh, dust proof and germ proof. It's your *own* cake of soap, for no other hands but yours, if you so wish it. And the rest of the family can all have their individual cakes of Packer's.

How your young "Scouts" will enjoy it! It is a real "kit" package! And don't forget Dad's locker at the club and his traveling bag! Sister, too—when she makes those long, delightful summer visits! How glad she'll be to carry her own cake of Packer's with her, with no extra wrapping!

There is no extra charge for the new metal box.

THE PACKER MANUFACTURING COMPANY, INC.,
Dept. 90-D, 120 W. 32nd Street, N. Y. C.
*Canadian Wholesale Distributors:* Lymans, Ltd., Montreal; The Lyman Bros. & Co., Ltd., Toronto.
Address all sample requests to The Packer Manufacturing Co., Inc.

*Shampoo with*
PACKER'S

*We have tried to see that every drug counter in the United States is ready to supply Packer's in its new metal soap box. But if you have any difficulty in obtaining it, send us 30c (the additional 5c to cover packing and postage). We will mail you one by parcel post.*


PRESS OF JUDD & DETWEILER, INC.
WASHINGTON, D. C.

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PRESS OF JUDD & DETWEILER, INC.
WASHINGTON, D. C.

# TWENTY million books like these were sent (upon request) to booklovers in every walk of life. They could either be returned or kept---as each person might decide. Yet, after examination, these *20,000,000 books were kept!* Don't you think it may be worth *your* while to examine this, "the most astonishing book-bargain ever offered."

DO YOU realize what an extraordinary fact this is? This is probably the greatest sale of a series of good books, in an equal period of time, in the history of the world. Was it super-salesmanship? No. *The books sold themselves in every case.* The book-lovers who sent for them examined the paper, the print, the binding—above all, the contents—at their leisure. Then, in the privacy of their own homes, with no salesman to urge them, they decided to purchase. Twenty million books purchased in this way! Can any more striking evidence be given, than this simple fact, of the value that we offer *you.*

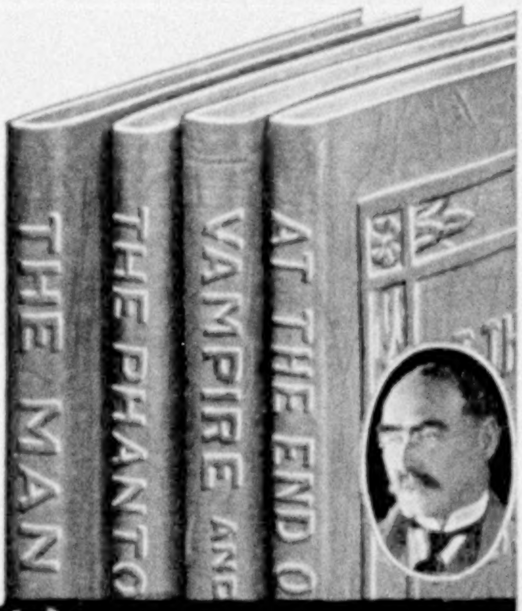
Here are thirty of the world's greatest masterpieces of literature, *each one complete.* They are books that will give you hours and hours of the richest entertainment and inspiration. They include the finest work of such immortal authors as Shakespeare, Kipling, Stevenson, De Maupassant, Emerson, Poe, Coleridge, Burns, Omar Khayyam, Macaulay, Lincoln, Washington, Oscar Wilde, Gilbert, Longfellow, Drummond, Conan Doyle, Edward Everett Hale, Thoreau, Tennyson, Browning, and others.

Each volume is beautifully bound in a rich embossed croft, which looks so much like leather that even experts are confused. The paper is the same as that used in books usually selling for $1.50 or $2.00 each. There are over 3,000 pages in the set.

*Yet the price is only $2.98 for the entire thirty volumes.* Do you wonder that people by the thousands write us, saying: "How in the world can you do it?" "This is the greatest bargain of my life!" "I never received so much for the money!" "They are more wonderful than represented!" And so forth.

## FREE--4 Volumes of Kipling

You have seen our advertisements before. Perhaps you have intended to send for these books, but neglected, through procrastination, to do so. If you will order at once, instead of waiting, we will include with the set four additional volumes of Kipling (in exactly the same binding). These four volumes include *The Vampire, and Other Verses; The Man Who Was; The Phantom Rickshaw; A Conference of the Powers; The Recrudescence of Imray; At the End of the Passage; The Mutiny of the Mavericks; My Own True Ghost Story.*




## Send No Money

If, in spite of the facts mentioned here, you are still the least bit doubtful, all we can do is to send this set of 30 volumes to YOU on approval. Do not send money—simply the coupon or a letter. When the books arrive, give the postman $2.98, plus the few pennies postage. Then, if for any reason or no reason, you are dissatisfied, send the set back any time within 30 days, and your money will be instantly refunded, as well as postal charges both ways.

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Little Leather Library Corp., Dept. 124
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Please send me on approval the 30 volumes of the Little Leather Library (and the four volumes of Kipling free). I will pay the postman $2.98 plus the postage, upon delivery. This is not, however, to be considered a purchase. If the books do not in every way come up to expectations, I may return them within 30 days, and you agree to return my money.
Note: We have made a special set of Hand Hammered Copper Book Ends to fit this set Regular $2.00 value, our price only 49c. If desired place x in this square . . . . ☐

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Address____________________________
City____________________State__________
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